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ARTICLES

COMMUNICATIONS

BOOK REVIEWS

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OTHER DEPARTMENTS

Number 58 of a series of photographs of past presidents of the Association

Edwin E. Witte

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ECONOMICS AND PUBLIC POLICY*

By Edwin E. Witte

I

It is well known that the original name for what is now generally called "economics" was "political economy." Most of the treatises written by the classical economists were books which they entitled *Political Economy.* At its first annual meeting in 1886, the American Economic Association adopted a four-point "platform," the first two and the last paragraphs of which read:[1]

1. We regard the state as an agency whose positive assistance is one of the indispensable conditions of human progress.
2. We believe that political economy as a science is still at an early stage of its development. While we appreciate the work of former economists, we look not so much to speculation as to the historical and statistical study of actual conditions of economic life for the satisfactory accomplishment of that development.

. . . .

4. In the study of industrial and commercial policy we take no partisan attitude. We believe in a progressive development of economic conditions, which must be met by a corresponding development of legislative policy.

And it also is noteworthy that the first publication of the American Economic Association was Henry C. Adams' essay on *The Relation of the State to Industrial Action*[2]—to my way of thinking still one of the soundest treatments of the subject.

* Presidential address delivered at the Sixty-ninth Annual Meeting of the American Economic Association, Cleveland, Ohio, December 28, 1956.

[1] For a more complete account of this early chapter in the history of the American Economic Association, see Joseph Dorfman, *The Economic Mind in American Civilization* (New York, 1949), Vol. III, pp. 205–12.

[2] *Publications of the American Economic Association*, Jan. 1887, I, 465–549; reprinted by the Columbia University Press, 1954, in *Relation of the State to Industrial Action and Economics and Jurisprudence* (edited by Joseph Dorfman).

There was strong opposition among economists to the original platform of the American Economic Association, despite its hedging on the most controversial issue of that day, the tariff. This opposition came principally from the supporters of unadulterated *laissez faire* who occupied the chairs of political economy in the largest universities. In 1887, the Association substituted for its platform the brief statement that its purpose was "the encouragement of economic research, especially the historical and statistical study of actual conditions." All of the dissenters, however, did not join the American Economic Association until, after a few years, it expressed complete neutrality on economic views and methods—a position it has consistently held ever since.

While neutral collectively, it is to the credit of economists that as individual scholars they have never ceased to be interested in questions of public policy. Few economists have held the view, which Charles A. Beard described as the dominant position in American thought around the turn of the century, and in accordance with which "government was looked upon as the badge of original sin, not to be mentioned in polite society." Economists of all schools of thought have often interested themselves in questions of public policy. Many of the major advances in economic theory have resulted almost directly from attempts to find solutions for practical public policy questions. This can be said of classical economics as well as of Keynesian and neoclassical economics, no less than of institutional economics. More economists today spend part of their active careers in government service than ever before. It is becoming commonplace that economists are in and out of government service several times during their lives and quite a number are working simultaneously for the government and in academic teaching or in research positions. Economists in the past have made significant contributions to the solution of practical problems of public policy and are doing so today.

But it is also true that economists have not received the recognition in the United States in the realm of public policy which they enjoy in other free countries. There has also developed much doubt whether economics should concern itself with problems of public policy. The clearest evidence of this is the change in the name of the social science of which we are students. What was once "political economy" became "economics" after the first world war, with but few exceptions.

While economists think, talk, and write about practical problems, their participation and influence is quite limited and it is doubtful whether it is increasing. Thousands of economists are employed in government. A former president of the American Economic Association is a distinguished U. S. Senator. A few other members of the Congress hold membership in the Association. The Council of Economic Advisers

is constituted of economists. Other economists are bureau chiefs and a somewhat larger number have held such positions. There are also a few members of the Association who hold elective or, more often, responsible appointive positions in state and local governments. Thousands of economists are civil service employees of the national, state, and local governments. Relatively few of these, however, are in major administrative positions and still fewer in decision-making spots. Most economists in government service are engaged in research studies, preparing reports and memoranda intended for the use of the decision-makers or the information of the public. They see the light of day only if superiors so decide and then usually with the authorship anonymous, at least as to most of the contributors. Many economists engaged in research work in the government are bitterly disappointed because they do not see what influence their studies have in practical affairs. Their research studies are valuable sources of information for academic students, but how much they influence policy decisions is debatable and doubtful. Beyond question, governmental research in economics and other social science fields is worth more than it costs, but its influence is seldom decisive.

Much lower in influence exerted, I believe, must be rated the pronouncements some academic economists make from time to time on issues of public policy. These often are lofty statements, as from Olympus, addressed to what is assumed to be a waiting America anxious to hear the words of economic wisdom on the practical issues of the day. Such pronouncements may have some influence. Politicians and manipulators of public opinion delight to cite as oracles known people who agree with them. But how much the noncommitted public is influenced is doubtful.

As I see it, the influence of economists on public affairs is principally that of scholars and teachers generally. This is the influence they exert upon their students and listeners and those who read what they have written. As John Maynard Keynes noted, the practical men of today often repeat what some professor or scribbler long since dead put into their heads.

This indirect influence obviously depends upon how well our students and readers grasp what we teach and the readiness with which they apply what they have learned to the practical public policy questions of the day. It is on this score that I have the most serious doubts about the contributions economists are making in the public policy field.

My reasons for doubts are that not much of what economists say and write seems to "stick with" students and readers. A large percentage of all college students today have some exposure to economics, particularly in the introductory or principles course. Most students thus exposed learn enough to pass this course. A smaller number, but still a

quite gratifying minority, make economics their major field of study and quite a few (although, perhaps, not enough to supply the to-be-anticipated demand for teachers of economics) go on with graduate work. But how much economics is learned "for keeps" from college courses is uncertain. Still more doubtful is whether college study of economics stimulates an abiding interest in the subject and gives the students the ability to think through economic problems.

As a former government official concerned with the settlement of labor disputes and since then as a privately selected labor arbitrator, I have been impressed by the fact that arguments based on economic principles are but seldom advanced by either party. Terms like "marginal utility," "labor mobility," "propensity to consume" and the like just do not occur in the presentation of actual labor cases. Yet the individuals presenting the arguments and some of the principals are often former students of economics—not uncommonly of not many years ago.

Similar failure to indicate that anything learned in courses in economics has "stuck" is all too evident in debates in legislative halls and on the political hustings, many of the participants in which, again, are former college students of economics. Some "eggheads" in public life have made fairly extensive use of economic principles, but have had little appeal to the public. Far more effective has been a repetition of platitudes about the economy, most of which have their origin with the public relations propagandists of business and other economic groups.

Economists frankly serving business, as increasing numbers are doing, apparently have been more successful in commanding an audience. But much of what many business economists, and the smaller number of labor economists, are saying cannot be regarded as original, amounting to little more than giving an aura of scholarship to what is essentially propaganda. By and large, business economics has been more influential than general economics. Business economists have become important advisers to great businesses, and some, as well as a few general economists, serve with distinction on boards of directors, and occasionally an economist becomes a business manager. Their influence on public affairs, however, also is quite limited.

II

Believing as I do that the original concept of economics, expressed in the old term "political economy" was sound, I inquire why economists have so little influence in public affairs. Among these reasons, I believe is the more recent attitude of looking upon government as belonging within the domain of the political scientist, and only on the periphery of economics.

This seems to me to greatly understate the importance of govern-

ment. Government and business or government's role in the economy has in the last quarter century become an important course subject in nearly all major universities. Almost without exception, however, textbooks written on this subject take a narrower view of the relations between government and business than the facts warrant. Some texts are pretty much treatises on the attempts to preserve competition through governmental action; others deal, more broadly, with all types of governmental regulation of private business. Some picture the economy as existing independently of government, which is reduced to an outside institution interfering with business in the interests of consumers or the general public. Government interference also is pictured as having been well nigh absent in the early history of our nation. And government regulation is discussed as still restricted mainly to public utilities and the fields of communication and transportation.

Studies sponsored by the Economic History Association in the last decade have established that this is a completely false account historically.[3] There never was a time when *laissez faire* prevailed in the United States. In the early days of the Republic there was rather more than less regulation of business than today. This was mainly local and state, rather than national regulation, but it was very extensive. Regulation has existed in the United States "from time immemorial," and substantially all businesses then existing were regulated. The Constitution was adopted not to give us a weaker but a stronger government. Not one line in that great instrument of freedom even remotely suggests a policy of *laissez faire*.

The American creed is not that of a government which is an oppressor but Lincoln's "a government of the people, by the people, and for the people." While wanting as little restriction as possible for the individual, Americans have always turned to government to help them when in economic difficulties. They have followed the principle, also expressed by Lincoln: "Government should do for a people what they cannot do themselves or that which they cannot do so well for themselves in their individual capacities."[4]

If all that government does is labeled "regulation," then government's role in the economy can be described as that of the regulator. To me it

[3] These include notable studies of the economic policies of the states prior to the Civil War, among them: Oscar and Mary Handlin, *Commonwealth: A Study of the Role of Government in the American Economy, Massachusetts, 1774–1861* (New York, 1947); Louis Hartz, *Economic Policy and Democratic Thought, 1776–1860* (Cambridge, 1948); Milton S. Heath, *Constructive Liberalism: The Role of the State in the Economic Development in Georgia to 1860* (Cambridge, 1954). Telling the same story are the many more specialized articles on the economic policies of the early United States by Carter Goodrich, president of the Economic History Association in 1956.

[4] "Fragment on Government," Nicolay and Hays, *Abraham Lincoln, Complete Works* (New York, 1890), Vol. I, p. 180.

seems preferable to use terms more accurately descriptive of the several things that government actually does in the economy. Confining "regulation" to direct government interference with private decision-making, government's activities in the economy go far beyond regulation.

To begin with, government is the rule maker and the umpire in the American system of free enterprise. Property, contract, patents, bankruptcy—in fact, all existing economic institutions—are defined by law. They represent bundles of rights and duties which may be modified and even terminated by constitutional processes. All basic economic institutions have undergone great changes in the course of American history. Property in human beings, at the time of the Constitution second in value only to land, has been abolished and the uses of many other types of property have been restricted in numerous respects. On the other hand, good will and other market expectations, almost unknown at the time of the Constitution, are now protected as property and collectively are of greater value than older, tangible forms of property. Changes in basic institutions must conform with constitutional limitations, but this has not prevented extensive changes. Such changes are still occurring and in all probability will continue to occur, as may be dictated by the needs and wisdom of the time.

Also most inadequately appreciated by economists has been the direct and indirect financial aid extended by government to many businesses in the United States throughout American history. Classical economics condemned "extraordinary encouragements" as well as "extraordinary restraints," but both have always existed in this country—and on a large scale. In recent years there has been a great outcry about government aids to agriculture. Historically, however, aids to other lines of business have been greater and may still be greater in the aggregate. The lands granted by Congress for the construction of the transcontinental railroads exceeded in area that of the entire State of Texas. Large aids by government, principally the state and local governments, were extended also for the construction of railroads in the older sections of the country—and earlier, of canals and turnpikes. Direct aids to shipping and ship building, airlines and aviation, mining and fisheries are more recent but also extensive. A large part of the capital for the development of new and risky industries has been supplied by government and never more extensively than in the present age. Whenever any major line of business has financial difficulties, it has turned to government for aid and, quite commonly, has received aid. Indirect aids, taking the form of protective tariffs, subsidies, loans, tax allowances, reduced mail rates, and similar privileges, have been no less important. Free enterprise, as we have known it, has always included a large amount of governmental aid to private business.

Government is the purchaser of a large part of the products of private industry and the supplier of many services vital to the economy. As Solomon Fabricant in his studies for the National Bureau has established, almost 10 per cent of all products of industry in recent years have been purchased by government, and a much higher percentage during the second world war.[5]

This is the age of the service state, in which government supplies many important services for the mass enjoyment of the people. Of these, defense is by far the most important. Education, highways, public welfare, and social security are very large service activities, as well as many others. Government as a producer is to some extent a competitor, but much more it is a stimulant to private business. The automobile, to cite but a single illustration, is credited with being indirectly the source of something like one-fifth of all employment today. But how large would be the automobile and related industries without the great public expenditures for the improved highways and the rapidly expanding outlays for parking facilities? A long list of businesses experiencing competition from government has been publicized by the Hoover Commission, but by far the most numerous instances it lists are those of government production of goods and services for its own use, not products produced for sale in the markets. Government as a purchaser, producer, and competitor is a field thus far left almost entirely by economists to politicians and propagandists, but which clearly merits much more attention from the point of view of its economic effects.

Government regulation of business has been less neglected and there is little need for stressing the importance of this aspect of political economy. Some regulation has existed from earliest times, but like everything else, regulation has changed with changing conditions. We no longer regulate chimney sweeps as Congress provided for in 1819, but we now regulate the beauticians and the barbers, the electricians and the plumbers, and, in some respects, all businesses.

More than in any other aspect of the government's role in the economy, economists long have been interested in its function as the preserver of competition. To the classical economists, competition was an all-sufficient regulator, once governmental encouragement of monopoly was ended. That view is not completely dead, but our antitrust and fair-trade-practices laws more and more have become regulatory legislation. While there are some doubts, particularly among business economists, about the wisdom of the underlying policies, it seems certain that competition and monopoly and government's re-

[5] Solomon Fabricant, *The Trend of Government Activity in the United States Since 1910* (New York, 1956).

sponsibilities in relation thereto, will continue to receive—as they should—a great deal of attention in public policy.

For some decades economists have devoted much attention to the government's responsibilities in relation to business stability and full employment, inflation and depression. Related are the government's control of the currency and its influence upon the volume of credit and the general level of the economy. More recent, but widespread, is interest in the factors promoting or retarding economic growth, which are greatly influenced by what government does. Economists have always appreciated the significance of government expenditures, taxes, and debts, and more so since the great depression and Keynesian economics. The relation of war to the economy has become increasingly significant in an age of great wars and ever-increasing preparation for future wars.

These are only some of the impacts of government on the economy and reasons why economics must concern itself with public affairs. John Maurice Clark, nearly thirty years ago, said in *The Social Control of Business:* "Control is an integral part of business, without which it would not be business at all. The one implies the other, and the two have grown together." Since then the interdependence of government and business certainly has increased. For an understanding of the economy, we must also understand government and appreciate the interrelation between government and business.

Government, however, is not all-powerful, and in a free society is certainly not the end objective of economic activity. In a democracy, government is only the largest and most inclusive of many associations of major importance. While it is the only organization which legally may use force to secure compliance with its decrees, it must operate essentially by consent. Ours is a volitional society in which the central problem is that of getting individuals to put forth their best efforts with a minimum of compulsion.

The end objective is individual and family welfare, much more than national strength, although the former promotes the latter. In the words of the late Msgr. John A. Ryan: "Industry exists for man, not man for industry"; and so also does government. It is the citizens, the human beings who constitute our society, who are central in our system of free enterprise and both the economy and the government exist to promote their welfare.

While our society is basically individualistic, it is also associational. One of the most characteristic differences between totalitarian and democratic governments lies in their respective attitudes toward voluntary associations among their citizens. Every totalitarian government ever known, whether of the right or the left, has either suppressed or brought under its complete control all associations within its borders.

Democracy, on the other hand, has encouraged free voluntary associations in the economic sphere, as well as in all other aspects of life. Dictators regard free voluntary associations as a challenge to their authority, while democracies regard them as instrumentalities to better promote and safeguard individual welfare, and thereby strengthen the entire society.

The American society from the outset has been one in which voluntary associations have played a large role. De Tocqueville, in his revealing observations on the United States in Jackson's day,[6] noted that Americans, with all their individualism, showed a remarkable capacity to associate with each other in their economic endeavors. Today, there are more associations in the United States than in any other land, and much more powerful organizations. We have nearly 500,000 business corporations and more than 50,000 labor unions, plus many thousands of trade associations, employers' associations, chambers of commerce, cooperatives, farmers' associations, and other similar economic organizations. Peter F. Drucker has characterized the America of today as being "enterprise directed," and holds that enterprise "is not the creature of the State" but "has its own law and rationale in its function."[7]

The fact that corporations differ so greatly in size and importance makes it difficult to grasp the significance of their remarkable growth. More than 90 per cent of the 500,000 corporations in this country are businesses differing from those conducted by individual entrepreneurs and partners only in the limited liability enjoyed by their owners and the life in perpetuity accorded them by law. But a thousand or so large corporations have very different and greater impacts on our society than the much more numerous individual entrepreneurs, partnerships, and small corporations. Not only do these large corporations transact directly half or more of all business in the United States and employ one-third of all labor in industrial employments, but they have many thousands of stockholders, suppliers, dealers, and distributors.

The present-day great corporation, moreover, is much more than merely a business organization. Through their public relations programs and other publicity media, corporations profoundly affect public opinion and in doing so also influence the outcome of political contests. In their dealings with business organizations outside the United States and to some extent indirectly with foreign governments, American corporations play a large role in international affairs. Particularly abroad but also in

[6] Alexis de Tocqueville, *De la Democratie en Amerique* (Brussels, 1840). Translation by Henry Reeve, with an Introduction by Henry Steel Commanger (New York, 1947).

[7] *The New Society: The Anatomy of the Industrial Order* (New York, 1950). See, also, A. A. Berle, Jr., *The 20th Century Capitalist Revolution* (New York, 1954) and Herrymon Mauer, *Great Enterprise: Growth and Behavior of the Big Corporation* (New York, 1955).

isolated areas in this country, corporations provide such services as housing, medical care, recreation, and education, which are merely incidental to their business activities, but often require a great deal of time from their executives and their boards of directors. Greatly on the credit side is what has been called "the public service revolution," manifested in the statements of many corporation executives emphasizing that service to all interested parties is an objective of American business, ranking ahead of the quest for ever larger profits.

On a former occasion I took the position,[8] that contrary to the fears of many economists and of large groups in the general public, American trade unions do not have nearly as great assets, influence, and power as have our large corporations. I still hold this view, but recognize that unions, too, profoundly affect the American way of life and in respects other than those narrowly considered economic. In its broader implications, the labor movement is a manifestation of the rise in the social order of the element in our population which was "born on the wrong side of the tracks" or whose ancestors were latecomers in this country. The advance of this group into the middle class appears to be one of the causes of the phenomenon, which Sumner H. Slichter and others have noted, of the growing moderation in the American views on public issues.

Many others of the numerous present-day associations also have great importance. What has been said about corporations and labor unions must suffice to illustrate both the significance of the associational element in our system of free enterprise and the desirability of a broader approach to many public policy questions than is customarily taken by theoretical economists.

Pointing in the same direction is "the managerial revolution." This is the divorce of control from ownership in the large corporation, which has all but become complete. In the large corporation, the functions usually still called those of the enterpreneur are now performed by professional managers. Management itself is a group, rather than an individual. Legally managers are employees and generally have but slight stock-ownership but they effectively run the corporation and at top levels they are pretty much self-perpetuating. Management has become an independent factor in production and often is the decisive element in the economic success of the corporation.[9]

The record of management, like that of the large corporations, has been one of great economic accomplishments. The United States has by far the largest group of professional managers, both in numbers and

[8] "The Role of Unions in Contemporary Society," *Indus. Lab. Rel. Rev.*, Oct. 1950, IV (1), 3–14.

[9] A recent good article developing this thought is Frederick Harbison, "Entrepreneurial Organization As a Factor in Economic Development," *Quart. Jour. Econ.*, Aug. 1956, LXX, 364–79.

proportionately to all industrial employees. Other technically trained personnel are also in excess demand, but managerial talent is most necessary of all and most difficult to develop. Both management and technology have been suggested to be basic factors in the economy on a par with the traditional land, labor, and capital. While not completely neglected, they have been assigned far too little importance by economists in explaining our productive accomplishments and possibilities and in considerations of economic growth and development on international levels.

III

John Williams in his presidential address in 1951[10] raised the question whether the thinking of economists leads and directs or merely follows changes in the environment. He concluded that most economic literature is a rationalization after the event. Pursuing his thought, it seems to me that at present, economists are doing but little leading in the domain of public policy. Further they have taken into account only very inadequately the many basic changes in the economy which have been occurring so rapidly in recent decades.

Twenty years ago an answer satisfying to many economists was given in Keynes' *General Theory* to the most pressing public policy question of the day, that of how to get out of the depression. With the changes in the environment since then, new questions have arisen and Keynesian economics seems less of a satisfying answer to all basic questions, although it is still very influential. Neoclassical economics probably has more followers than earlier, but gives few answers to current public policy questions. Institutional economics has regained some popularity after years of neglect and ridicule. But, to me, institutional economics seems more of a method of approach to public policy questions than an over-all economic theory.

While a majority will differ, it is my thought that the approach of the institutional economists has much to commend it. On another occasion, I described this approach as "a practical problems approach," with emphasis upon finding answers to the many new economic problems of the day.[11] John Williams—who, I suspect, would object to any identification with the institutional economists—expressed my thought in the statement that "economic theorizing . . . [is] pointless unless it is aimed at what to do," and further that the "pretension to universality . . . is the inescapable bane on theorizing."[12] I do not imply that others than institutional economists have not concerned themselves with practical

[10] "An Economist's Confessions," *Am. Econ. Rev.*, March 1952, XLII, 1–24.

[11] "Institutional Economics as Seen by an Institutional Economist," *So. Econ. Jour.*, Oct. 1954, XXI, 131–40.

[12] *Op. cit.*, p. 10.

problems. Present-day theorists do express themselves on practical public policy issues and advise the policy makers. Not only, however, are many of them somewhat apologetic in doing so, but greatly prefer to deal with universal truths which lend themselves to model building and mathematical reasoning.

Back of this attitude is not merely the quest for universality, but an overpowering desire to be scientific. In common with many other social scientists, economists as a group long for the exactitude of the natural sciences. The nearest approach to such precision seems to many to lie in the reduction of economic problems to mathematical equations and then in the application of the proven laws of mathematics to their solution. Justice Holmes, the great dissenter, once said: "The future belongs to the man of statistics and the master of economics."[13] But Holmes could not anticipate the present vogue among economists for mathematics, which has produced a situation in which many, perhaps a majority, of the members of the Association, like myself, cannot even read a large percentage of the articles published in the *Review* and other economic journals. A difficult specialized language has the advantages of appearing very learned and may afford some protection against witch-hunters, but it loses listeners and readers. I do not want to be understood as suggesting that articles with a good deal of mathematics in them should not be published in economic journals, but only that I would like to see more articles that I can read. A fundamental difficulty with the mathematical approach to economics is the frequent impossibility of taking account in the equations of all factors, particularly changing factors. Just as there is danger of superficiality in institutional economics, so there is danger of unreality in mathematical economics. Econometrics and mathematical economics have such value and hoped-for promise that they merit the position they have attained, in most major universities, of inclusion in the program of instruction for graduate students. But they fall far short of giving economics the precision of the natural sciences. Nor is there any other approach that offers greater hope for absolute precision.

While not decrying the econometricians or other economists who are trying to make economics an exact science, it seems to me very desirable that other economists should continue to pursue other methods in their attempts to gain a better understanding of the economy and in seeking correct answers to the practical problems of economic life. Man is more complex than material things and does not lend himself to the same sort of experimentation as do guinea pigs. In general controlled experiments are not possible in economics; accurate observation and reasoning from observed facts is as far as we can go in the discovery of truth. It is com-

[13] Quoted in Samuel F. Konefsky, *The Legacy of Holmes and Brandeis* (New York, 1956).

forting that many of the basic truths in the natural sciences were discovered by similar nonexact methods, long before the present accurate methods of measurement were known.

Although exact scientific measurements are impossible for the solution of many economic problems, a scientific attitude is a *sine qua non*. By that term I refer, first and foremost, to complete honesty and impartiality. Economists, like all others who merit the high distinction of being known as scholars and scientists, may never compromise with truth and must have the courage of their convictions. Falsifying, coloring, or twisting the truth is contemptible, whether it be done for compensation, to gain notoriety, or to curry favor. A scientific attitude demands an inquiring mind, a strong urge to know, and tireless industry to explore every aspect of the problem. It calls for the rechecking of results and a willingness to change opinions when the evidence warrants. It appears most favorably when accompanied by personal modesty and a high degree of fairness, manifested alike toward pioneers and predecessors, contemporaries and those holding variant views. It calls for thorough knowledge of what has been done before and for keeping abreast with current research. These are difficult standards to meet, but such an attitude is necessary and attainable, although the exactitude of the natural sciences is presently impossible and may never be realized.

Much more harmful than the quest for the certainty of the natural scientists is the attitude that economists should confine themselves to aspects of practical problems that are strictly within the domain of economics, defined as including little more than the price mechanism and equilibrium analysis. Extremists holding this position scoff at the very idea that anyone but an economist has anything worthwhile to say on the solution of practical economic problems. Related is the idea that the only worth-while answers to economic questions are to be found in applications of general economic theory.

A less extreme variant is the view that economists should deal only with the economic aspects of problems but should participate with other social scientists in interdisciplinary research. This calls for each group of social scientists tackling a given problem by its own methods and in its specialized language, followed by an interchange of views between all of the researchers. Through such a procedure a truer answer is expected than can be gotten from a one-discipline approach by economists or by any other group of social scientists. This position has something like official blessing in the action of the foundations in especially encouraging interdisciplinary research. No great discoveries have thus far come from such interdisciplinary research, which may mean only that it is too early to correctly appraise the results. Certain it is, that this is costly research, best suited to wealthy foundations, large universities,

or physically nearby institutions. Its greatest value may lie in acquainting scholars from different academic fields with the language and approaches of the other disciplines. That is not without importance, but is unsuited to public agencies needing prompt answers to practical questions and to economists in struggling institutions who have no established reputations.

The idea underlying interdisciplinary research is sound. Questions of public policy do not fall into the tight rubrics of academic disciplines. For the answers to practical questions more than one and often many academic disciplines need to be brought into the picture. There are no hard and fast lines separating economics from politics, law, sociology, psychology, and philosophy. Even technical matters, geographic facts, and certainly the historical and institutional background need to be taken into account by the economist seeking answers to practical problems. Economics is not timeless and placeless and is more than an exercise in logic or a mathematical problem. All social sciences blend into each other, as in fact do all elements of our culture. Economics has to do with the aspect of man concerned with the satisfaction of his material wants. But it is ever the whole man who acts in economic matters. To lose sight of this basic fact is but to grope for economic truth in a way akin to the study of the elephant by the blind men of the fable, not one of whom could get an even approximately correct picture of the great animal.

How to get a broad over-all view which also has depth is the $64 question (or to use a more up-to-date analogy, the correct answer to the final question which gives ownership to everything in the show). In my article on institutional economics I took the position that the practical economist needs to know his way about in all the social sciences, and that in addition he should be broadly cultured, with some bent toward the technical, in a mechanical age. I now recognize that this is a well-nigh impossible prescription for economists in this complex age. Few, if any, economists can be super Leonardo da Vincis, or Benjamin Franklins, or Thomas Jeffersons—not to mention the wisdom of Lincoln.

I certainly do not propose that study of practical economic problems should be restricted to supermen. Rather, I believe that every educated person, specifically everybody who regards himself as an economist, should interest himself in practical economic problems. While some economists may do better with abstract, over-all problems, the great majority will be well advised to deal with concrete questions which appear not to be too large for their capabilities and resources.

What is essential is not a mastery of all disciplines which may have something to contribute to the solution of economic problems, but an appreciation that economics does not afford all of the answers. This calls

for broadly trained, cultured economists, rather than narrow specialists. It is impossible for anyone to know beforehand the intricacies of all domains of knowledge which impinge on a given problem. Prior training can only equip the student with a realization that all aspects of a given problem need to be studied before a worthwhile answer will emerge. In the actual study of practical economic problems the researcher, and still less the administrator and policymaker, cannot stop at the bounds of what the theorist believes to be economics. He needs to become acquainted with everything that has bearing on the problem being studied, whether it be economics or anything else.

Aspects not deemed by most economists to be economics do have importance for the solution of many economic problems. Man's motivation in dealing with economic problems is not solely economic. The economic man is a fiction, but the whole man a reality. To gain economic ends, men resort to many practices which do not make sense from a purely economic point of view. Beliefs actually held are scarcely less important than what people ought to think.

Taking into account noneconomic aspects places a heavy responsibility on the economist who studies questions of public policy. He has to learn much that is new to him, including what often is an unfamiliar language. But he generally can get help from specialists in other disciplines, provided he appreciates the need for such help and knows from whom to inquire. It is true also that practical problems seldom involve all aspects of any academic discipline. To grasp noneconomic aspects no great advance knowledge of other disciplines is required, only a desire to understand the total setting and tireless study of the problem in its entirety, no matter where it may lead.

I would add two other requisites for fruitful study of economic policy questions. One is a genuine interest in the problem studied and zeal to bring about improvement and correction of what is wrong. The other is realization that institutions and conditions can be changed and that progress and improvement are possible. Without real enthusiasm, no study ever gets very far. Research which is merely part of the day's work that has to be done lacks the fire needed to make it significant. It is also my belief that for significant study of economic problems the incentive afforded by possible economic gain will but seldom prove adequate, as the returns are almost always small. Likewise, the motive of merely accurately describing what exists is sufficient only for the exceptional teacher, as also is that of trying to extol the existing institutions. The most significant work on practical economic problems has been done by people who have been inspired by a desire to change and improve what exists.

A final admonition to the would-be researcher and the most impor-

tant is to actually start and carry through a research project. A university colleague who has won fame as a novelist once told me: "Writers are of two kinds. One kind are those who plan and talk about writing; the others those who sit down at the typewriter and write." Having reached an age when most of my career is behind me, I recognize how little I have accomplished and say to my friends: "Avoid my mistake of putting off planned research and writing." With age, enthusiasm wanes, as does energy. Studies which do not get beyond the planning stage are but seldom worth anything, and unfinished studies rarely can be completed by anyone else. A scholar will always share knowledge with others, but the man who has done the research is likely to be the man best qualified to interpret it and to carry it to completion.

In common with most others who have discussed the subject, it is my conviction that economists should be encouraged to engage in research. Similarly, I believe that it is desirable that they should get practical experience in business and/or government, with the idea of later returning to teaching. I hold these views, in part, because I believe that research and practical experience are broadening and enrich teaching. I also believe that we need to find solutions for many economic problems to insure the further and rapid progress we ought to have.

I would direct much of this research to public policy questions. Particularly valuable, I believe, is field research. It is important for economists early to realize that not everything worth knowing about economics and practical public policy questions is to be found in books, or can be grasped by thinking about problems in a swivel chair, or arrived at by solving mathematical equations based on unproven assumptions. The advice John R. Commons always gave his students: "Do not only read and think but observe" is as valuable today as it was when I studied with him as a graduate student. Besides furnishing training in gathering original information, field research should prove most helpful in the discovery of new truths and in sweeping away unfounded beliefs.

Not everybody has talents which will bring fame in research. But I am of the opinion that useful economic research can be done by many more economists than do any research. Many of the practical problems of the day are narrower than the weighty matters principally discussed in meetings like this. Ph.D. theses are supposed to be original pieces of research and quite a few are creditable examples. However, it is tragic that many of the authors of these theses never complete any similar studies or publish anything. Subjects for profitable research are all about us. No practical question is too unimportant to merit study. The beginner, as well as the economist who gets no foundation or other financial support, is probably well advised to tackle problems which seem to him to be quite small. Usually, as small problems are studied

they grow larger; moreover, answers to small problems as well as to large ones are needed.

Anyone who engages in research always faces the possibility of failure. Even if no solutions are found, much may be gained. Study of problems has its own reward in the inner satisfaction it affords and the broadening influence it has. The natural scientists have come to regard the experiment that fails, if accurately performed, as but little less valuable than the one that succeeds. In Henry Van Dyke's delightful little essay "Alpenrosen and Goat's Milk,"[14] the story is told of the Swiss village festival in which the highpoint was the climbing of the greased pole. Youth after youth attempted the feat only to fail. Finally, the hero got to the top and received great plaudits. But as Van Dyke remarked, much of the credit belonged to those who preceded him and rubbed the grease off the pole.

IV

I believe that economics does have great possibilities and a promising future. To begin with, we will have far more students. More students will increase our problems, but also will be a great challenge and opportunity. There are now a million fewer people of college age than prior to the second world war, but above a million more students in colleges and universities. Enrollment figures are once more increasing and, if the present percentages going to college are maintained, will increase more than 50 per cent within less than fifteen years. There is every reason, moreover, to expect that the very pronounced trend toward a large percentage of young men and women actually going to college will continue. There are forecasts that within a generation as large a percentage of the people of college age will actually attend college as the present percentage of boys and girls of high school age enrolled in secondary schools. That percentage is now 88, compared with less than 15 per cent at the beginning of the century. College enrollments were less than 5 per cent in 1900; today, close to 30 per cent.

Many will view the expected increase in enrollments with alarm. It will prove more difficult to staff economics departments adequately with qualified teachers. There is even now a shortage of qualified faculty in some schools of business administration and in the economics departments of some small colleges. The number of graduate students in economics, excluding students from abroad, moreover, has been decreasing rather than increasing. More graduate students, including some who earn Ph.D. degrees, go into business. There is also some attrition in economics faculties by reason of the higher salaries in other comparable occupations. Whether the prospects of an increasing demand and a

[14] In *Little Rivers* (New York, 1911), pp. 165–214.

possibly declining supply of teachers of economics will result in increased salaries or in heavier teaching loads and more teaching by inadequately prepared assistants can be answered certainly only in the future.

In addition to increased full time enrollments, economists are confronted with increasing demands for their services in adult education. Through part-time instruction, conferences, and lectures, immense numbers of adults are getting some instruction on economic subjects. It is my view that responsibility for such teaching should not be shunted off entirely on half-trained, young instructors—although their youth and energy is a great asset in educational work of this type. Increased college enrollments, and growing demands in adult education, will add to the teaching responsibilities of economists.

I make no claims to pedagogical wisdom. While I have been a teacher for half of my adult life, I confess to some of the disdain which university professors display towards the professional educational-methods people—without real justification, I will add. But my experience as a university teacher and lecturer and as a civil service employee and an appointed official has given me some ideas which I hope are worth expressing, in view of the large educational task which confronts the economists in the period immediately ahead.

It has been said that the purpose of formal education—certainly of higher education—is not to give people knowledge but to get them to think. This is a truism, with which I, of course, agree. But I would add: "Not only to think , but to read and observe." Students and, still more, American adults read little that is not required or is not in picture or capsule form. Even among people doing economic research, it is a common occurrence that they often display ignorance of what has been done earlier on the subject. There may be a thrill in rediscovering independently what could be learned by reading, but it does seem a waste of time. Without depreciating visual instruction—which has great merit in mass education—I believe that it is sound counsel to urge upon all teachers of economics to insist upon wide reading, in the training both of graduate and undergraduate students. It is through such insistence upon reading that even when confronted with such large numbers of students as we are, we may hope to be able to acquaint them with different points of view and in the process stimulate thinking on the subject. Such a method also has the advantage of keeping the professor on his toes, which is essential for effective teaching.

Getting students to observe requires even greater skill on the part of the instructor. It is a method, however, of enlivening classroom discussion, particularly if the observations are related to what is presented in the lectures, text, and readings. For graduate students it is most desirable in connection with reports and theses. In many branches of eco-

nomics, field study seems to me well-nigh indispensable in the training of graduate students. If it can be guided so that the professor and the students work together on the same problems, an almost ideal relationship between teachers and students can be created.

These suggestions, I know, add to the work required of teachers of economics, in "handling" the large numbers of students the near future will bring. But few other efforts can be so rewarding in personal satisfactions, influence exerted, and friendships formed.

The increasing demands which teaching is making upon the academic economists operate to make incidental research more difficult. Even more they furnish an excuse to many for not attempting any original studies. On the other hand, far more funds from foundations and other sources are becoming available for research leaves for studies at home and abroad. Opportunities for temporary employment in government have not increased and many conditions continue to make government service unattractive. Employment by business with the idea of later returning to teaching offers increasing opportunities, but is subject to the drawback that it is hard to give up the larger business salaries. All told, however, opportunities for full-time research are distinctly better than ever before.

I am of the opinion that academic economists should go on research leaves when they have opportunity to do so and have a subject in which they are vitally interested and to the study of which it seems they can profitably devote a year or so. Generally, both the recipients of the grants and the institutions giving them a leave, will profit from such interruptions of academic teaching. But the recipients have a heavy obligation to complete the studies they undertake, in fairness to the donors and their own institutions, to say nothing about the harm they otherwise do to their reputations and to the profession.

Besides full-time leaves for research, I strongly believe in the study of original problems by teachers of economics on a part-time basis and even without any time allowances—although these are desirable. By some, such research can profitably be directed toward the theoretical aspects of economics. More generally, I believe, it can best be devoted to questions of practical public policy and to studies of the historical, institutional, and factual background of economic problems. There are many more problems in this domain with which the part-time researcher can hope to deal successfully than in the theoretical field.

There are serious difficulties which the would-be researcher must overcome. An obvious difficulty is that of finding the time for research, confronted, as are most economists, with overloaded teaching programs. There is also the problem that there are too few publication outlets for economic research, particularly on applied practical subjects. A very

serious handicap is the lack of appreciation in the profession and outside of it of the economist whose research does not produce earth-shaking results. Even knowing where to begin is not simple.

Suggestions which might prove helpful for economic research, particularly on practical public-policy questions, include these: Public agencies might well consider "farming out" research on economic problems to universities in the manner of the natural science agencies, far more than they are now doing. They also might prepare compendia on practical research subjects not urgently requiring immediate answers, with data on sources of information. Mature scholars could do the same and foundations profitably could aid them financially to make such reports.

The important matter of giving credit for research to the academic people who do such work is, first and foremost, a matter of recognition within the profession. Economists, like all other people, appreciate most the good opinion of their fellows. Yet the economists seem to be much more given to knocking than to boosting each other. The theorists scoff at institutionalists and vice versa. Worse is the fact that even men in the same department generally know little about the research their colleagues are doing. One small step toward improvement might be to give all members of the department an opportunity, at least once a year, to talk to their colleagues about the research in which they are engaged. In smaller institutions, the traditional general economics seminar might well serve this purpose; in larger institutions, regular or special department meetings. The regional economics associations, I believe, have their greatest value in affording a forum to younger and less well-known scholars. This is also one of the values and justifications for the growing number of allied social science associations which supplement the American Economic Association. While their existence has the tendency to make the programs of the A.E.A. meetings more theoretical and to give most of the places to the limited number of economists with reputations for original work in economic theory (most of whom are connected with a small number of large universities), the allied association affords opportunities to give recognition to the larger number of economists who work in applied fields and on practical problems.

Above all, I plead for tolerance among economists for differing points of view and varying fields of usefulness. Is it too much to expect or at least to hope that economists will adopt the attitude which prevails in the older professions? Lawyers, who put on a great show in battling each other in the court room and on the hustings, always speak of each other's reputations in terms of praise and will insist that a lawyer should be selected for every position which even remotely may require some speaking acquaintance with the law. Doctors seldom will expose errors

of other members of the profession. Economists, in contrast, often with sadistic glee devote a large part of their efforts to tearing down the reputations of other economists. This reflects more than the relative newness of economics and the apologetic attitude many economists have because they are not certain that our discipline is either a science or a profession. Assuredly, it involves bad manners, which as individuals we should guard against. A word of approval for work well done is far more helpful than the most logical criticism, which overlooks human sensibilities.

In the last analysis, research has its own rewards. There are few satisfactions as great as the sense of accomplishment which a scholar gets when he completes a well-done task. This is particularly true of research on public policy questions; for as Robert M. LaFollette, Sr. said, in an address at the University of Wisconsin, in the year I enrolled as a freshman, more than 50 years ago: "It is a glorious service, this service for country. Each one should count it a patriotic duty to build at least a part of his life into the life of his country, to do his share in the making of America according to the plan of the fathers."

Concluding this old man's counsel of advice, which makes no pretense at words of wisdom, I can do no better than to quote President Theodore Roosevelt's statement exalting the doer of deeds:

> It is not the critic who counts; not the man who points out how the strong man stumbled, or where the doer of deeds could have done them better. The credit belongs to the man who is actually in the arena; whose face is marred by dust and sweat and blood; who strives valiantly; who errs and comes up short again and again; who knows the great enthusiasms, the great devotions and spends himself in a worthy cause; who at the best knows in the end the triumphs of high achievement; and who at the worst, if he fails, at least fails while daring greatly; so that his place shall never be with those cold and timid souls who know neither defeat nor victory.[16]

[16] Quoted by President Franklin D. Roosevelt in his Madison Square Garden Address on the eve of the election of 1936.

THE SIMPLE ANALYTICS OF WELFARE MAXIMIZATION

By Francis M. Bator*

It appears, curiously enough, that there is nowhere in the literature a complete and concise nonmathematical treatment of the problem of welfare maximization in its "new welfare economics" aspects. It is the purpose of this exposition to fill this gap for the simplest statical and stationary situation.

Part I consists in a rigorous diagrammatic determination of the "best" configuration of inputs, outputs, and commodity distribution for a two-input, two-output, two-person situation, where furthermore all functions are of smooth curvature and where neoclassical generalized diminishing returns obtain in all but one dimension—returns to scale are assumed constant. Part II identifies the "price-wage-rent" configuration embedded in the maximum problem which would ensure that decentralized profit- and preference-maximizing behavior by atomistic competitors would sustain the maximum-welfare position. Part III explores the requirements on initial factor ownership if market-imputed (or "as if" market-imputed) income distribution is to be consistent with the commodity distribution required by the maximum-welfare solution. Part IV consists in brief comments on some technical ambiguities, *e.g.*, the presumption that all tangencies are internal; also on a number of feasible (and not so feasible) extensions: more inputs, outputs and households; elasticity in input supplies; joint and intermediate products; diminishing returns to scale; external interactions. The discussion is still stationary and neoclassical in spirit. Then, in Part V, the consequences of violating some of the neoclassical curvature assumptions are examined. Attention is given to the meaning, in a geometric context, of the "convexity" requirements of mathematical economics and to the significance of an important variety of nonconvexity—increasing returns to scale—for "real" market allocation, for Lange-Lerner type "as if" market allocation, and for the solubility of a maximum-of-welfare problem. Finally, Part VI contains some brief remarks on possible dynamical extensions. A note on the seminal literature concludes the paper.[1]

* The author, a member of the senior staff of the Center for International Studies, Massachusetts Institute of Technology, is indebted to R. S. Eckaus and R. M. Solow for suggestive comment.

[1] Anyone familiar with the modern literature will recognize my debt to the writings of Professor Samuelson. Reference is to be made, especially, to Chapter 8 of *Foundations of Economic*

I. *Inputs, Outputs and Commodity Distribution*

Take, as given:

(1) Two inelastically supplied, homogeneous and perfectly divisible inputs, labor-services (L) and land (D). This "Austrian" assumption does violate the full generality of the neoclassical model; elasticity in input supplies would make simple diagrammatic treatment impossible.

(2) Two production functions, $A=F_A(L_A, D_A)$, $N=F_N(L_N, D_N)$, one for each of the two homogeneous goods: apples (A) and nuts (N). The functions are of smooth curvature, exhibit constant returns to scale and diminishing marginal rates of substitution along any isoquant (*i.e.*, the isoquants are "convex" to the origin).

(3) Two ordinal preference functions, $U_X=f_X(A_X, N_X)$ and $U_Y=f_Y(A_Y, N_Y)$—sets of smooth indifference curves convex to the origin—one for X and one for Y. These reflect unambiguous and consistent preference orderings for each of the two individuals (X and Y) of all conceivable combinations of own-consumption of apples and nuts. For convenience we adopt for each function an arbitrary numerical index, U_X and U_Y, to identify the indifference curves. But the functions have no interpersonal implications whatever and for any one individual they only permit of statements to the effect that one situation is worse, indifferent or better than another. We do require consistency: if X prefers situation α to situation β and β to γ, then he must prefer α to γ; indifference curves must not cross. Also, satiation-type phenomena and Veblenesque or other "external" effects are ruled out.

(4) A social welfare function, $W=W(U_X, U_Y)$, that permits a unique preference-ordering of all possible states based only on the positions of both individuals in their own preference fields. It is this function that incorporates an ethical valuation of the relative "deservingness" of X and Y.

The problem is to determine the maximum-welfare values of labor input into apples (L_A), labor input into nuts (L_N), land input into apples (D_A), land input into nuts (D_N), of total production of apples (A) and nuts (N), and, last, of the distribution of apples and nuts between X and Y (A_X, N_X, A_Y, N_Y).

A. *From Endowments and Production Functions to the Production-Possibility Curve*

Construct an Edgeworth-Bowley box diagram, as in Figure 1, with horizontal and vertical dimensions just equal to the given supplies, re-

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Analysis (Cambridge, 1947); to "Evaluation of Real National Income," *Oxford Econ. Papers*, Jan. 1950, II, 1–29; and to "Social Indifference Curves," *Quart. Jour. Econ.*, Feb. 1956, LXX, 1–22.

spectively, of D and L, and plot the isoquants for apples with the south-west corner as origin and those for nuts with origin at the northeast corner. Every point in the box represents six variables, L_A, L_N, D_A, D_N, A, N. The problem of production efficiency consists in finding the locus of points where any increase in the production of apples implies a necessary reduction in the output of nuts (and vice versa). The diagram shows that locus to consist in the points of tangency between the nut and apple isoquants (FF).

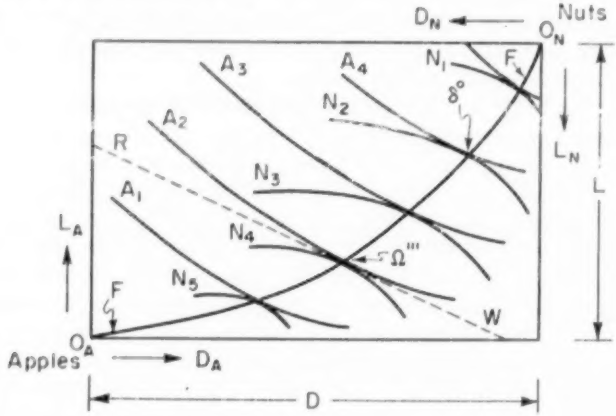

FIGURE 1

From this efficiency locus we can read off the maximal obtainable combinations of apples and nuts and plot these in the output (AN) space. Given our curvature assumptions we get the smooth concave-to-the-origin Pareto-efficient production-possibility curve $F'F'$ of Figure 2.[2] This curve, a consolidation of FF in Figure 1, represents input-output configurations such that the marginal rate of substitution (MRS) of labor for land in the production of any given quantity of apples—the absolute value of the slope of the apple isoquant—just equals the marginal rate of substitution of labor for land in the production of nuts.[3]

[2] This presumes, also, that the intrinsic factor intensities of A and N differ. If they did not, $F'F'$ would be a straight line—a harmless special case. (See V-3-c below.)

[3] In marginal productivity terms, MRS, at any point, of labor for land in, *e.g.* apple production—the absolute value (drop all minus signs) of the slope of the apple isoquant (Figure 1)—is equal to

$$\left[\frac{\text{Marginal Physical Product of Land}}{\text{Marginal Physical Product of Labor}}\right]$$

in apple production at that point. In the symbolism of the calculus

$$\left|\frac{\partial L_A}{\partial D_A}\right|_{\Delta A=0} = \left(\frac{\partial A}{\partial D_A}\right) \div \left(\frac{\partial A}{\partial L_A}\right).$$

The slope (again neglecting sign) at any point on the production-possibility curve of Figure 2, in turn, reflects the marginal rate of transformation (MRT) at that point of apples into nuts. It indicates precisely how many nuts can be produced by transferring land and labor from apple to nut production (at the margin), with optimal reallocation of inputs in the production of both goods so as to maintain the MRS-

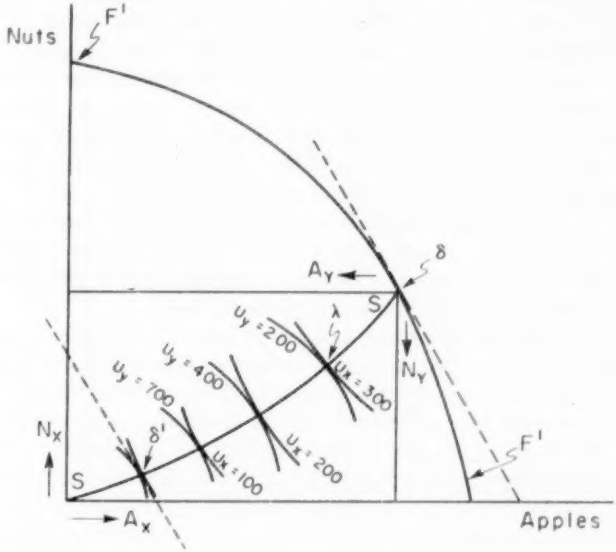

FIGURE 2

equality requirement of Figure 1. It is the marginal nut-cost of an "extra" apple—or the reciprocal of the marginal apple-cost of nuts.

B. *From the Production-Possibility Curve to the Utility-Possibility Frontier*

Pick any point, δ, on the production-possibility curve of Figure 2: it denotes a specific quantity of apples and nuts. Construct an Edgeworth-Bowley (trading) box with these precise dimensions by dropping from δ lines parallel to the axes as in Figure 2. Then draw in X's and Y's indifference maps, one with the southwest, the other with the northeast corner for origin. Every point in the box again fixes six variables: apples to X (A_X) and to Y (A_Y), nuts to X (N_X) and to Y (N_Y), and the "levels" of satisfaction of X and Y as measured by the ordinal indices U_X and U_Y which characterize the position of the point with respect to the two preference fields. For example, at λ in Figure 2, $U_X=300$, $U_Y=200$. Note again, however, that this 200 is incommensurate with

the 300: it does not imply that at λ X is in some sense better off than is Y (or indifferent, or worse off).

The problem of "exchange-efficiency" consists in finding that locus of feasible points within the trading box where any increase in X's satisfaction (U_X) implies a necessary reduction in the satisfaction of Y, (U_Y). Feasible in what sense? In the sense that we just exhaust the fixed apple-nut totals as denoted by δ. Again, the locus turns out to consist of the points of tangency, *SS*, and for precisely the same analytical reasons. Only now it is the marginal subjective rate of substitution of nuts for apples in providing a fixed level of satisfaction for X—the absolute slope of X's indifference curve—that is to be equated to the nut-apple MRS of Y, to the slope, that is, of *his* indifference curve.

From this exchange-efficiency locus,[4] *SS*, which is associated with the single production point δ, we can now read off the maximal combinations of U_X and U_Y obtainable from δ and plot these in utility (U_XU_Y) space ($S'S'$, Figure 3). Each such *point* δ in output space "maps" into a *line* in utility space—the U_XU_Y mix is sensitive to how the fixed totals of apples and nuts are distributed between X and Y.[5]

There is a possible short-cut, however. Given our curvature assumptions, we can trace out the grand utility-possibility frontier—the envelope—by using an efficiency relationship to pick just one point from each trading box contract curve *SS* associated with every output point δ. Go back to Figure 2. The slope of the production-possibility curve at δ has already been revealed as the marginal rate of transformation, via production, of apples into nuts. The (equalized) slopes of the two sets of indifference contours along the exchange-efficiency curve *SS*, in turn, represent the marginal rates of substitution of nuts for apples for psychic indifference (the same for X as for Y). The grand criterion for efficiency is that it be impossible by any shift in production *cum* exchange to increase U_X without reducing U_Y. Careful thought will suggest that this criterion is violated unless the marginal rate of transformation between apples and nuts as outputs—the slope at δ—just equals the common marginal rate of substitution of apples and nuts, as consumption "inputs," in providing psychic satisfaction.

[4] This is Edgeworth's contract curve, or what Boulding has aptly called the "conflict" curve—once on it, mutually advantageous trading is not possible and any move reflecting a gain to X implies a loss to Y.

[5] Each *point* in utility space, in turn, maps into a line in output-space. Not just one but many possible apple-nut combinations can satisfy a specified U_XU_Y requirement. It is this reciprocal point-line phenomenon that lies at the heart of Samuelson's proof of the nonexistence of community indifference curves such as would permit the derivation of demand curves for apples and nuts. The subjective "community" MRS between *A* and *N* for given fixed *A* and *N*, *e.g.*, at δ in Figure 2, would surely depend on how the *A* and *N* are distributed, *i.e.*, on which U_XU_Y point on *SS* is chosen. Hence the slope of a "joint" *XY* indifference curve at δ is not uniquely fixed by *AN*. (See citation [11] in bibliography.)

If, for example, at δ one can get two apples by diverting resources and reducing nut-output by one, a point on SS where the (equalized) marginal rate of substitution of apples for nuts along indifference curves is, *e.g.*, one to one, permits the following "arbitrage" operation. Shift land and labor so as to produce two more apples and one less nut. Then, leaving X undisturbed take away one nut from Y and replace it by one apple. By our assumption that MRS=1 both X and Y are left indifferent: U_X and U_Y remain unaltered. But we have an extra apple left over; since this permits raising U_X and/or U_Y, the initial situation was not on the U_XU_Y frontier.[6]

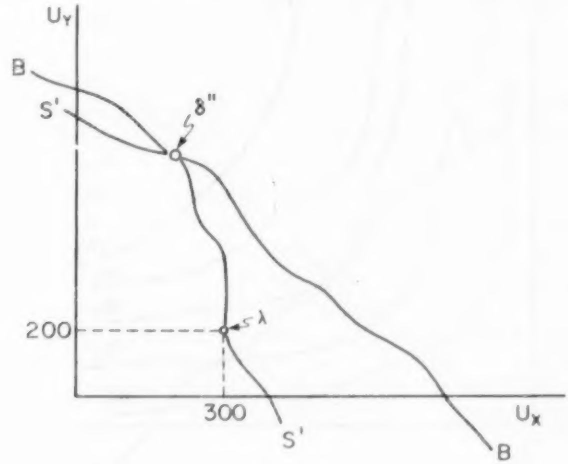

FIGURE 3

To be on the grand utility-possibility frontier (BB of Figure 3), then, MRT_δ must equal the (equalized) MRS of the indifference contours along the SS associated with δ. This requirement fixes the single U_XU_Y point on SS that lies on the "envelope" utility-possibility frontier, given the output point δ. Pick that point on SS, in fact, where the joint slope of the indifference curves is exactly parallel to the slope at δ of the production-possibility curve. In Figure 2 this point is at δ', which gives the one "efficient" U_XU_Y combination associated with the AN mix denoted by δ. This U_XU_Y combination can then be plotted as δ'' in Figure 3.[7]

[6] The above argument can be made perfectly rigorous in terms of the infinitesimal movements of the differential calculus.

[7] Never mind, here, about multiple optima. These could occur even with our special curvature assumptions. If, for example, both sets of indifference curves show paths of equal MRS

Repetition of this process for each point on the production-possibility curve—note that each such point requires a new trading box—will yield the grand utility-possibility frontier of Pareto-efficient input-output combinations, *BB*. Each point of this frontier gives the maximum of U_X for any given feasible level of U_Y and vice versa.

C. *From the Utility-Possibility Frontier to the "Constrained Bliss Point"*

But *BB*, the grand utility-possibility function, is a curve and not a point. Even after eliminating all combinations of inputs and outputs

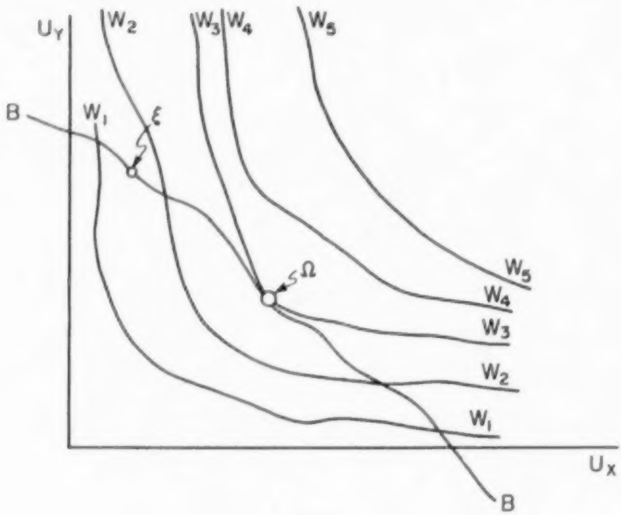

FIGURE 4

that are nonefficient in a Paretian sense, there remains a single-dimensional infinity of "efficient" combinations: one for every point on *BB*. To designate a single *best* configuration we must be given a Bergson-Samuelson social welfare function that denotes the ethic that is to "count" or whose implications we wish to study. Such a function—it could be yours, or mine, or Mossadegh's, though his is likely to be non-transitive—is intrinsically ascientific.[8] There are no considerations of

that coincide with straight lines from the origin and, further, if the two preference functions are so symmetrical as to give an SS_I that hugs the diagonal of the trading box, then either every point on SS_I will satisfy the MRS = MRT criterion, or none will. For discussion of these and related fine points see Parts IV and V.

[8] Though it may provide the anthropologist or psychologist with interesting material for scientific study.

economic efficiency that permit us to designate Crusoe's function, which calls for many apples and nuts for Crusoe and just a few for Friday, as economically superior to Friday's. Ultimate ethical valuations are involved.

Once given such a welfare function, in the form of a family of indifference contours in utility space, as in Figure 4, the problem becomes fully determinate.[9] "Welfare" is at a maximum where the utility-possibility envelope frontier BB touches the highest contour of the W-function.[10] In Figure 4, this occurs at Ω.

Note the unique quality of that point Ω. It is the only point, of all the points on the utility frontier BB, that has unambiguous normative or prescriptive significance. Pareto-efficient production and commodity-distribution—being on $F'F'$ and also on BB—is a necessary condition for a maximum of our kind of welfare function, but is not a sufficient condition.[11] The claim that any "efficient" point is better than "inefficient" configurations that lie inside BB is indefensible. It is true that given an "inefficient" point, there will exist *some* point or points on BB that represent an improvement; but there may well be many points on BB that would be worse rather than better. For example, in terms of the ethic denoted by the specific W-function of Figure 4, Ω on BB is better than any other feasible point. But the efficient point ξ is distinctly inferior to any inefficient point on or northeast of W_2. If I am X, and if my W-function, which reflects the usual dose of self-interest, is the test, "efficient" BB points that give a high U_Y and a very low U_X are clearly less desirable than lots of inefficient points of higher U_X.[12]

[9] In the absence of implicit income redistribution these curves cannot be transposed into output-space. They are not community indifference curves which would permit the derivation of demand schedules. See fn. 5 and 12, also IV-3.

[10] If there are several such points, never mind. If the "ethic" at hand is really indifferent, pick any one. If it doesn't matter, it doesn't matter.

[11] Note, however, that Pareto-efficiency is not even a necessary condition for a maximum of just any conceivable W-function. The form of our type function reflects a number of ethically loaded restrictions, *e.g.*, that individuals' preference functions are to "count," and count positively.

[12] Note, however, that no consistency requirements link my set of indifference curves with "my" W-function. The former reflects a personal preference ordering based only on own-consumption (and, in the more general case, own services supplied). The latter denotes also values which I hold as "citizen," and these need not be consistent with maximizing my satisfaction "*qua* consumer." X as citizen may prefer a state of less U_X and some U_Y to more U_X and zero U_Y. There is also an important analytical distinction. X's preference function is conceptually "observable": confronted by various relative price and income configurations his consumption responses will reveal its contours. His W-function, on the other hand, is not revealed by behavior, unless he be dictator, subjected by "nature" to binding constraints. In a sense only a society, considered as exhibiting a political consensus, has a W-function subject to empirical inference (*cf.* IV-3). The distinction—it has a Rousseauvian flavor—while useful, is of course arbitrary. Try it for a masochist; a Puritan. . . .

D. *From "Bliss Point" to "Best" Inputs, Outputs and Commodity-Distribution*

We can now retrace our steps. To Ω on BB in Figure 4, there corresponds just one point, Ω', on the production-possibility curve $F'F'$ in Figure 5. (We derived BB, point by point, from $F'F'$ of Figure 2: and the $F'F'$ of Figure 5 is copied from that of Figure 2.) Ω' fixes the output

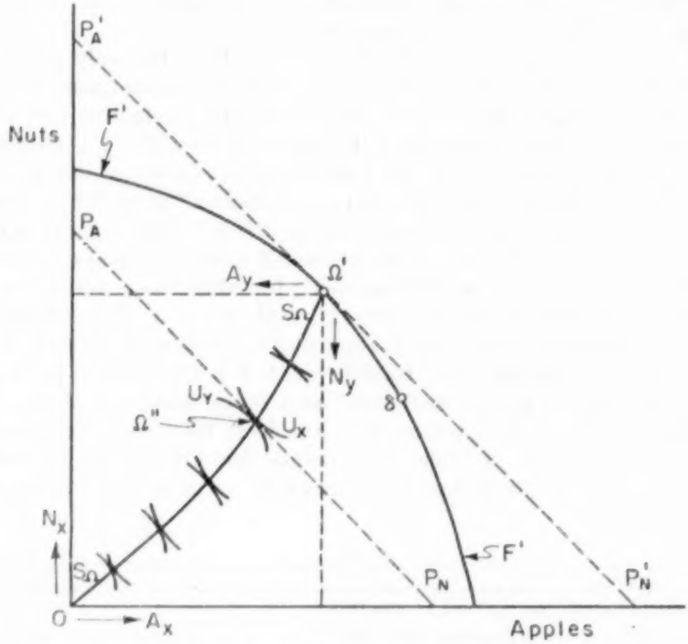

FIGURE 5

mix: A and N. Then, by examining the trading-box contract curve $S_\Omega S_\Omega$ associated with Ω' of $F'F'$, we can locate the one point where U_X and U_Y correspond to the coordinates of Ω in utility space. The equalized slope of the indifference curves will at that point, Ω'', just equal the slope of $F'F'$ at Ω'. Ω'' fixes the apple-nut distribution implied by the maximum of W: A_X, A_Y, N_X, and N_Y. Further, we can now locate the point Ω''' on the Pareto-efficient input locus, FF of Figure 1, that corresponds to Ω' of $F'F'$. It fixes the remaining variables, the factor allocations: L_A, D_A, L_N, and D_N. The maximum-welfare configuration is determinate. We have solved for the land and labor to be used in

apple and nut production, for the total output of apples and nuts, and for their distribution between X and Y.

II. *Prices, Wages and Rents*

The above is antiseptically independent of institutional context, notably of competitive market institutions. It could constitute an intellectual exercise for the often invoked man from Mars, in how "best" to make do with given resources. Yet implicit in the logic of this purely "technocratic" formulation, embedded in the problem as it were, is a set of constants which the economist will catch himself thinking of as prices. And wisely so. Because it happens—and this "duality" theorem is the kernel of modern welfare economics—that decentralized decisions in response to these "prices" by, or "as if" by, atomistic profit and satisfaction maximizers will result in just that constellation of inputs, outputs and commodity-distribution that our maximum of W requires.[13]

Can these constants—prices, wages, rents—be identified in our diagrammatic representations?[14] Only partially so. Two-dimensionality is partly at fault, but, as we shall see, a final indeterminacy is implied by the usual curvature assumptions themselves.[15] The diagrams will, however, take us part way, and a little algebra will do for the rest.

The exercise consists in finding a set of four constants associated with the solution values of the maximum problem that have meaning as the price of apples (p_A), the price of nuts (p_N), the wage rate of labor (w), and the rental rate of land (r).[16]

First, what can be said about w and r? Profit maximization by the individual producer implies that whatever output he may choose as most lucrative must be produced at a minimum total cost.[17] The ele-

[13] Note that this statement is neutral with respect to (1) genuine profit maximizers acting in "real" but perfectly competitive markets; (2) Lange-Lerner-type bureaucrats ("take prices as given and maximize or Siberia"); or (3) technicians using electronic machines and trying to devise efficient computing routines.

[14] To avoid institutional overtones, the theory literature usually attempts verbal disembodiment and refers to them as shadow-prices. The mathematically oriented, in turn, like to think of them as Lagrangean multipliers.

[15] These very assumptions render this last indeterminacy, that of the absolute price level, wholly inconsequential.

[16] Since we are still assuming that all the functions have neoclassical curvature properties, hence that, *e.g.*, the production-possibility curve, as derived, has to be concave to the origin, we can impose the *strong* condition on the constants that they exhibit optimality characteristics for genuine, though perfect, markets. It will turn out, however, that two progressively weaker conditions are possible, which permit of some nonconvexities (*e.g.*, increasing returns to scale), yet maintain for the constants some essentially price-like qualities. More on this in Part V.

[17] In our flow model, unencumbered by capital, this is equivalent to producing the chosen output with minimum expenditure on inputs.

mentary theory of the firm tells us that, for this condition to hold, the producer facing fixed input-prices—horizontal supply curves—must adjust his input mix until the marginal rate of substitution (MRS) of labor for land just equals the rent-to-wage ratio. It is easy to see the "arbitrage" possibilities if this condition is violated. If one can substitute one unit of L for two units of D, and maintain output constant, with $w=\$10$ and $r=\$10$, it surely reduces total cost to do so and keep doing so until any further reduction in D by one unit has to be matched, if output is not to fall, by adding no less than one unit of L. In the usual diagrammatic terms, then, the producer will cling to points of tangency between the isoquants and (iso-expenditure) lines whose absolute slope equals r/w.

Reversing the train of thought, the input blend denoted by the point Ω''' in Figure 1 implies a shadow r/w ratio that just equals the MRS of labor for land in the production of both apples and nuts at that point Ω'''. $MRS_{\Omega'''}$ is given by the (equalized) slopes of the isoquants at Ω'''. The implicit r/w, therefore, must equal the slope of the line RW that is tangent to (both) the isoquants at Ω'''.[18]

The slope of RW identifies the rent:wage ratio implied by the maximal configuration. Essentially analogous reasoning will establish the equalized slope of the indifference curves through Ω'', in Figure 5, as denoting the p_A/p_N ratio implied by the solution. X, as also Y, to maximize his own satisfaction as measured by U_x, must achieve whatever level of satisfaction his income will permit at a minimum expenditure. This requires that he choose an apple-nut mix such that the psychic marginal-rate-of-substitution between nuts and apples for indifference just equal p_A/p_N. He, and Y, will pick Ω'' only if p_A/p_N is equal to the absolute slope of the tangent (P_AP_N) at Ω''. This slope, therefore, fixes the Ω-value of p_A/p_N.[19]

Note that this makes p_A/p_N equal to the slope also of the production-possibility curve $F'F'$ at Ω'.[20] This is as it should be. If $p_A/p_N=10$, *i.e.*, if one apple is "worth" ten nuts on the market, it would be odd in-

[18] Again, absolute values of these slopes are implied throughout the argument. Recall from footnote 3 that the labor-for-land MRS, the absolute slope of the isoquants at Ω''' as given by RO_A/WO_A, is equal to the

$$\left[\frac{\text{Marginal Physical Product of Land}}{\text{Marginal Physical Product of Labor}}\right] \text{ratio.}$$

Our shadow r/w, then, turns out to be just equal to that ratio.

[19] The price-ratio relates reciprocally to the axes: $p_A/p_N=P_AO/P_NO$ in Figure 5. Along, *e.g.*, X's indifference curve (U_X at Ω'') a rise in p_A/p_N, *i.e.*, a steepening of P_AP_N, results in a substitution by X of nuts for apples; ditto for Y.

[20] Remember, in choosing the one point on $S_\Omega S_\Omega$ that would lie on the envelope in utility space, we chose the point where the indifference curve slopes just equaled the marginal rate of transformation (see p. 27 above).

deed, in our frictionlessly efficient world of perfect knowledge, if the marginal rate of transformation of nuts into apples, via production, were different from ten-to-one. Producers would not in fact produce the apple-nut combination of Ω' if p_A/p_N differed from MRT at Ω'.

We have identified the r/w and p_A/p_N implied by the maximum of W. These two constancies provide two equations to solve for the four unknown prices. Unfortunately this is as far as the two-dimensional diagrammatics will take us. None of the diagrams permit easy identification of the relationship between the input prices and the output prices. Yet such a relationship is surely implied. By the theory of the firm we know that the profit-maximizing producer facing a constant price for his product—the horizontal demand curve of the perfectly competitive firm—will expand output up to where his extra revenue for an additional unit of output, *i.e.*, the price, just equals the marginal cost of producing that output.[21] And marginal cost, in turn, is sensitive to r and w.

It would be easy to show the implied price-wage or price-rent relationships by introducing marginal productivity notions. Profit maximization requires that the quantity of each input hired be increased up to the point where its marginal physical product times the price of the extra output, just equals the price of the added input. Since these marginal physical productivities are determinate curvature properties of the production functions, this rule provides a third relationship, one between an output price and an input price.

Alternatively, given our assumption that production functions show constant returns to scale, we can make use of Euler's "product exhaustion" theorem. Its economic content is that if constant returns to scale prevails, the total as-if-market-imputed income of the factors of production just "exhausts" the total value of the product. This means, simply, that $wL+rD=p_AA+p_NN$, and it provides a third relationship between w, r, p_A and p_N for the Ω-values of L, D, A and N.[22]

At any rate, the maximal solution implies a third price-equation, hence we can express three of the prices in terms of the fourth. But what of the fourth? This is indeterminate, given the characteristics of the model. In a frictionless world of perfect certainty, where, for example, nobody would think of holding such a thing as money, only *relative*

[21] Never mind here the "total" requirement—that this price exceed unit cost—if the real-life profit-seeking producer is to produce at all. More on this in Part V.

[22] The condition also holds for each firm. In a competitive and constant-returns-to-scale world the profit-maximum position is one of zero profit: total revenue will just equal total cost. It should be said, however, that use of the Euler theorem to gain a relationship between input price and output price involves a measure of sleight of hand. It is only as a consequence of the relationships between price and marginal productivity (*cf.* the preceding paragraph) that the theorem assures equality of income with value of product.

prices matter. The three equations establish the proportions among them implied by the maximum position, and the absolute values are of no import. If the $p_A:p_N:w:r$ proportions implied by Ω are 20:15:50:75, profit and satisfaction maximizers will make the input-output-consumption decisions required for the maximum-of-W irrespective of whether the absolute levels of these prices happen to be just 20:15:50:75, or twice, or one-half, or 50 times this set of numbers. This is the implication of the fact that for the maximum problem only the various transformation and substitution *ratios* matter. In all that follows we shall simply posit that nuts are established as the unit of account, hence that $p_N=1$. This then makes p_A, w and r fully determinate constants.[23]

Summarizing: we have identified diagrammatically two of the three shadow-price relationships implied by the solution to the welfare-maximum problem and have established, in a slightly more roundabout way, the existence of the third. The purpose was to demonstrate the existence, at least in our idealized neoclassical model, of a set of constants embedded in the "technocratic" maximum-of-welfare problem, that can be viewed as competitive market prices.[24] In what sense? In the sense that decentralized decisions in response to these constants, by, or "as if" by, atomistic profit and satisfaction maximizers will result in just that configuration of inputs, outputs and commodity-distribution that the maximum of our W requires.

III. *Factor Ownership and Income Distribution*

We have said nothing, so far, of how X and Y "pay" for their apples and nuts, or of who "owns" and supplies the labor and the land. As was indicated above, the assumption of constant returns to scale assures that at the maximum welfare position total income will equal total value of output, and that total revenue from the sale of apples (nuts) will just equal total expenditures for inputs by the producers of apples (nuts). Also, the "solution" implies definite "purchase" of apples and of nuts both by X and by Y. But nothing ensures that the initial "ownership" of labor-hours and of land is such that w times the labor-hours supplied by X, wL_X, plus r times the land supplied by X, rD_X—X's income—will suffice to cover his purchases as required by Ω'', *i.e.*, $p_AA_X+p_NN_X$; similarly for Y. There does exist some Pareto-efficient solution of inputs, outputs and distribution that satisfies the "income =outgo" condition for both individuals for any arbitrary pattern of ownership of the "means of production"—a solution, that is, that will place the system somewhere on the grand utility-possibility envelope

[23] For the possibility of inessential indeterminacies, however, see Part IV-2.

[24] On the existence of such a set of shadow prices in the kinky and flat-surfaced world of linear programming, see Part V, below.

frontier (*BB* in Figure 4). But only by the sheerest accident will that point on *BB* be better in terms of my *W*-function, or Thomas Jefferson's, or that of a "political consensus," than a multidimensional infinity of other points *on or off* *BB*. As emphasized above, only one point on *BB* can have ultimate normative, prescriptive significance: Ω; and only some special ownership patterns of land and of labor-services will place a market system with an "as imputed" distribution of income at that special point.[25]

The above is of especial interest in evaluating the optimality characteristics of market institutions in an environment of private property ownership. But the problem is not irrelevant even where all nonhuman means of production are vested in the community, hence where the proceeds of nonwage income are distributed independently of marginal productivity, marginal-rate-of-substitution considerations. If labor-services are not absolutely homogeneous—if some people are brawny and dumb and others skinny and clever, not to speak of "educated"—income distribution will be sensitive to the initial endowment of these qualities of mind and body and skill relative to the need for them. And again, only a very low probability accident would give a configuration consistent with any particular *W*-function's Ω.[26]

Even our homogeneous-labor world cannot entirely beg this issue. It is not enough to assume that producers are indifferent between an hour of X's as against an hour of Y's labor-services. It is also required that the total supply of labor-hours per accounting period be so divided between X and Y as to split total wage payments in a particular way, depending on land ownership and on the income distribution called for by Ω. This may require that X supply, *e.g.*, 75 per cent of total L; each man working $\frac{1}{2}L$ hours may well not do.[27]

But all this is diversion. For our noninstitutional purposes it is sufficient to determine the particular L_X, D_X, L_Y and D_Y that are consistent

[25] It is of course possible to break the link between factor ownership and "final" income distribution by means of interpersonal transfers. Moreover, if such transfers are effected by means of costless lump-sum devices—never mind how feasible—then it is possible, in concept, to attain the Ω-implied distribution irrespective of market-imputations. But no decentralized price-market-type "game" can reveal the pattern of taxes and transfers that would maximize a particular *W*-function. "Central" calculation—implicit or explicit—is unavoidable.

[26] If slavery were the rule and I could sell the capitalized value of my expected lifetime services, the distinction between ownership of labor and that of land would blur. Except in an "Austrian" world, however, it would not vanish. As long as men retain a measure of control over the quality and time-shape of their own services, there will always remain an incentive problem.

[27] All this is based on the "Austrian" assumption that labor is supplied inelastically; further, that such inelasticity is due not to external compulsion, but rather to sharp "corners" in the preference-fields of X and Y in relation to work-leisure choices. More than this, the *W*-function must not be sensitive to variations in the $L_X L_Y$ mix except as these influence income distribution.

with Ω, given market-imputed, or "as if" market-imputed, distribution. Unfortunately the diagrams used in Part I again fail, but the algebra is simple. It is required that:

$$wL_X + rD_X = p_A A_X + p_N N_X,$$

and

$$wL_Y + rD_Y = p_A A_Y + p_N N_Y,$$

for the already-solved-for maximal Ω-values of A_X, N_X, A_Y, N_Y, p_A, p_N, w and r. Together with $L_X+L_Y=L$ and $D_X+D_Y=D$, we appear to have four equations to solve for the four unknowns: L_X, L_Y, D_X and D_Y. It turns out, however, that one of these is not independent. The sum of the first two, that *total* incomes equal *total* value of product, is implied by Euler's theorem taken jointly with the marginal productivity conditions that give the solution for the eight variables, A_X, N_X, A_Y, . . . which are here taken as known. Hence, we have only three independent equations. This is as it should be. It means only that with our curvature assumptions we can, within limits, fix one of the four endowments more or less arbitrarily and still so allocate the rest as to satisfy the household budget equations.

So much for the income-distribution aspects of the problem. These have relevance primarily for market-imputed income distribution; but such relevance does not depend on "private" ownership of nonlabor means of production. Note, incidentally, that only with the arbitrary "Austrian" assumption of fixed supplies of total inputs can one first solve "simultaneously" for inputs, outputs and commodity-distribution, and only subsequently superimpose on this solution the ownership and money-income distribution problem. If L_X, D_X, L_Y, D_Y, hence L and D were assumed sensitive to w, r, the p's and household income levels, the dimensions of the production-box of Figure 1, hence the position of the production-possibility curve of Figures 2 and 5, etc., would interdepend with the final solution values of L_X, D_X, L_Y and D_Y. We would then have to solve the full problem as a set of simultaneous equations from the raw data: production functions, tastes (this time with an axis for leisure, or many axes for many differently irksome kinds of labor), and the W-function. Three (or more) dimensional diagrams would be needed for a geometrical solution.

IV. *Some Extensions*

We have demonstrated the solution of the maximum problem of modern welfare economics in context of the simplest statical and stationary neoclassical model. Many generalizations and elaborations suggest themselves, even if one remains strictly neoclassical and restricts oneself to a steady-state situation where none of the data change and

no questions about "how the system gets there" are permitted to intrude. To comment on just a few:

1. The problem could well be solved for many households, many goods, and many factors: it has received complete and rigorous treatment in the literature. Of course the diagrammatics would not do; elementary calculus becomes essential. But the qualitative characteristics of the solution of the *m* by *n* by *q* case are precisely those of the 2 by 2 by 2. The same marginal rate of transformation and substitution conditions characterize the solution, only now in many directions. Nothing new or surprising happens.[28]

2. The solution did skirt one set of difficulties that were not explicitly ruled out by assumption. We tacitly assumed that the two sets of isoquants would provide a smooth locus of "internal" tangencies, *FF*, in the production box of Figure 1; similarly, that we would get such an "internal" *SS* in the trading boxes of Figures 2 and 5. Nothing in our

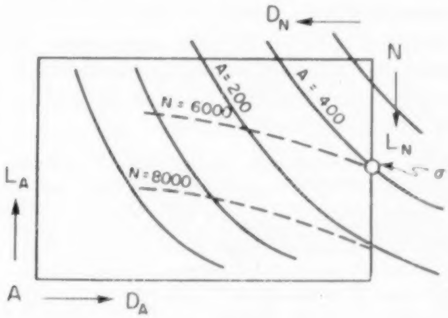

FIGURE 6

assumptions guarantees that this should be so. What if the locus of maximum *A*'s for given feasible *N*'s, should occur not at points of strict tangency *inside* the box, but at what the mathematician would call corner-tangencies along the edges of the box? Figure 6 illustrates this possibility. The maximum feasible output of A, for $N=6000$, occurs at σ, where $A=400$; but at σ the two isoquants are not strictly tangent (they touch but have different slopes). The economic meaning of this is simple. With endowments as indicated by the dimensions of the production box in Figure 6, and with technology as denoted by the isoquants, it is not possible to reallocate inputs until the MRS of labor for

[28] Rigorous general treatment of the $m \times n \times q$ situation does highlight a number of analytical fine points that are of interest to the pure theorist, *e.g.*, the difficulties encountered if the number of factors exceeds the number of goods. But the qualitative economics is the same. For a full treatment from a nonnormative point of view, see P. A. Samuelson, "Prices of Factors and Goods in General Equilibrium," *Rev. Econ. Stud.*, 1953–1954, XXI (1), No. 54, 1–20.

land is the same in apple as in nut production. This is because apple technology (as depicted) is so land-using relative to nut production that the

$$\left[\frac{\text{marginal productivity of land}}{\text{marginal productivity of labor}}\right] \text{ratio}$$

in apple production exceeds that in nut production even when, as at σ, *all* land is devoted to apples.

Space precludes further analysis of such corner-tangency phenomena. They reflect the possibility that the maximum-welfare solution may require that not every input be used in producing every output (*e.g.*, no land in nut production or no brain surgeons in coal mining), and may even render one of the inputs a "free good," so that its total use will not add up to the total available supply. Let it suffice to assert that by formulating the maximum conditions, not in terms of *equalities* of various slopes, but rather in terms of *inequalities*; by explicit statement of the proper second-order "rate-of-change-of-slope" conditions; and by allowing inequalities in the factor-balance conditions (*e.g.*, $L_A + L_N \leqq L$), such phenomena of bumping into the axes can be handled; further, that only inessential indeterminacies occur in the implied shadow-price configuration.[29]

[29] All this can perhaps be made clearer by two examples. The essential requirement for A_σ to be at a maximum for $N=6000$ is that the intersection at the boundary be as in Figure 6 rather than as in Figure 7. In the latter, σ' gives a minimum of A for $N=6000$; the true maximum is at σ''. The distinction between σ in 6 and σ' in 7 is between the relative rates of change of the two MRS's. The price indeterminacy implied by the maximum, *i.e.*, the fact that σ is consistent with an r/w that lies anywhere between the two isoquants, turns out to be inessential. A second example concerns the theory of the firm. It has been argued that if the marginal cost curve has vertical gaps and the price-line hits one of these gaps, then the $MC=p$ condition is indeterminate, hence that the theory is no good. As has been pointed out in the advanced literature (*e.g.*, by R. L. Bishop, in "Cost Discontinuities . . . " *Am. Econ. Rev.*, Sept. 1948, XXXVIII, 607–17) this is incorrect: What is important is that at smaller than equilibrium output MC be less than price and at higher outputs MC exceed price. It is true, but quite harmless to the theory, that such a situation does leave a range of indeterminacy in the price

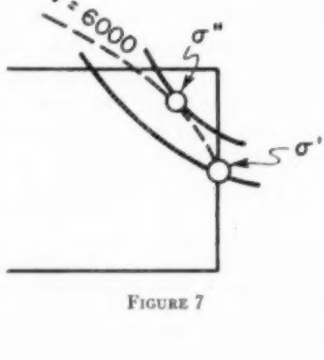

FIGURE 7

3. We stressed, above, the nonexistence of *community* indifference contours such as would provide a unique ranking, for the community as a whole, of various output combinations.[30] Individual marginal rates of substitution between, *e.g.*, apples and silk shirts, equalized along a trading-box contract curve to give a "community" MRS, are likely to be sensitive to the distribution of income[31] between gourmets and dandies; accordingly, community MRS at a given point in commodity space, *i.e.*, the slope of a curve of community indifference, will vary with movements along the associated utility-possibility curve. However, once the most desirable $U_X U_Y$ combination for a given package of A and N is fixed, MRS at that AN-point becomes determinate. It follows, as recently pointed out and proved by Samuelson,[32] that if the observed community continuously redistributes "incomes" in utopian lump-sum fashion so as to maximize, in utility space, over the W-function implied by a political consensus, then there does exist, in output space, a determinate *social* indifference function which provides a ranking for the community as a whole of all conceivable output combinations. This function, which yields conventionally convex social indifference contours, can be treated as though a single mind were engaged in maximizing it. Moreover, in concept and if granted the premise of continuous redistribution, its contours are subject to empirical inference from observed price-market data.

This existence theorem justifies the use of *social* indifference maps—maps "corrected" for distribution—in handling problems of production efficiency, international trade, etc.—a substantial analytical convenience.[33] More important, it provides a conceptual foundation, however abstract, for prescription based not on just any arbitrary ethic, but rather on the particular ethic revealed by a society as reflecting its own political consensus.[34]

4. It is useful, and in a mathematical treatment not difficult, to drop the "Austrian" assumption of inelastically supplied inputs, and intro-

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that will elicit *that* level of output. Such phenomena do change the mathematics of computation. Inequalities cannot in general be used to eliminate unknowns by simple substitution. On all this, see the literature of linear programming (*e.g.*, citations [10] and [13]).

[30] See fn. 5.

[31] In terms of abstract purchasing power.

[32] See citation [11].

[33] Note, however, that none of this eliminates the need for a W-function: social indifference contours are a convex function of individual taste patterns of the usual ordinal variety taken jointly with an implicit or explicit W-function of "regular" content and curvature. Further, no ultimate superiority attaches to the W-function implied by a particular political consensus. One may disapprove of the power relationships on which such consensus rests, etc.

[34] Needless to say, feasibility is not here at issue. Even on this level of abstraction, however, matters become much more difficult once account is taken of the fact that the world is not stationary.

duce leisure-work choices.[35] The analytical effect is to sensitize the production-possibility curve to the psychic sensibilities—the preference functions—of individuals. Note that the empirical sense of doing so is not confined to an institutional or ethical context of nonimposed choice. A dictator, too, has to take account of such choices, if only because of feasibility limitations on coercion.

5. We assumed away joint-product situations. This is convenient for manipulation but hardly essential; the results can be generalized to cover most kinds of jointness. It turns out, in fact, that in dynamical models with capital stocks, one means for taking account of the durability of such stocks is to allow for joint products. A process requiring a hydraulic press "produces" both stamped metal parts and a "one-year-older" hydraulic press.

6. In our system the distinction between inputs (L, D) and outputs (A, N) could be taken for granted. But the distinction is clear only in a world of completely vertically-integrated producers, all hiring "primary" nonproduced inputs and producing "final" consumable goods and services. In a Leontief-like system that allows for inter-producer transactions and intermediate products, many outputs: electricity, steel, corn, beef, trucks, etc., are simultaneously inputs. It is of interest, and also feasible, to generalize the analysis to take account of, *e.g.*, coal being used not only to heat houses, but to produce steel required in the production of mining machines designed for the production of coal. Moreover, none of the essential qualitative characteristics of our maximum problem is violated by such generalization.[36]

7. What if instead of assuming that production functions show constant returns to scale, we permit diminishing returns to proportional expansion of inputs? This could be due either to inherent nonlinearities in the physics and topography of the universe, or to the existence of some unaccounted-for but significant input in limited, finite-elastic supply.[37]

[35] If we assume only one commodity, say apples, and replace the second good by leisure (or by negative labor input); and if we let the second-good production function be a simple linear relation, our previous geometry will portray the simplest goods-leisure situation.

[36] Analytically, this is done by designating all produced goods as X_1, X_2, X_3 . . . . The gross production of, *e.g.*, X_1 has two kinds of uses: It is partly used up as an input in the production of X_2, X_3 . . . and perhaps of X_1 (the automobile industry is a major user of automobiles). What remains is available for household consumption. The production functions have X's on the right- as well as the left-hand side.

[37] If "output" varies as the surface area of some solid body and "input" as its cubic-volume, a doubling of input will less than double output—this is an example of the first kind. A typical example of the second is the instance where the production function for fishing does not include an axis for the "amount" of lake, hence where beyond a certain point doubling of man-hours, boats, etc. less than doubles the output. There is a slightly futile literature on whether the first kind could or could not exist without some element of the second. If *every* input is really

Diminishing returns to scale, as distinct from increasing returns, does not give rise to serious trouble, either for the analytical solubility of the system, or for the market-significance of the intrinsic price-wage-rent constants. It does introduce some ambiguities, however. For one thing, the "value" of output will exceed the total of market-imputed income. This makes intuitive sense in terms of the "unaccounted-scarce-factor" explanation of decreasing returns; the residual unimputed value of output reflects the income "due" the "hidden" factor. If that factor were treated explicitly and given an axis in the production-function diagram, returns would no longer diminish—since, on this view, the relative inexpansibility of that input gave rise to decreasing returns to scale to begin with—and the difficulty would vanish.[38]

In a market context, this suggests the explicit introduction of firms as distinct from industries. In our constant-returns-to-scale world the number of apple- or nut-producing firms could be assumed indeterminate. Every firm could be assumed able to produce any output up to A_Ω (or N_Ω) at constant unit cost. In fact, if we had a convenient way of handling incipient monopoly behavior, such as by positing frictionless entry of new firms, we could simply think of one giant firm as producing all the required apples (nuts). Such a firm would be compelled, nevertheless, to behave as though it were an "atomistic" competitor, *i.e.*, prevented from exploiting the tilt in the demand curve, by incipient competitors ready instantaneously to jump into the fray at the slightest sign of profit.

It is, however, natural, at least in a context of market institutions, to think of decreasing returns to scale, as associated with the qualitatively and quantitatively scarce entrepreneurial entity that defines the firm but is not explicitly treated as an input. Then, as apple production expands, relatively less efficient entrepreneurs are pulled into production —the total cost curve of the "last" producer and the associated shadow price of apples become progressively higher—and the intramarginal firms make "profits" due directly to the scarcity value of the entrepreneurial qualities of their "entrepreneurs." The number of firms, their inputs and outputs, are determinate. The last firm just breaks even at the solution-value of the shadow-price.[39]

doubled, so say the proponents of one view, output *must* double. The very vehemence of the assertion suggests the truth, to wit, that it is conceptually impossible to disprove it by reference to empirical evidence. Luckily, the distinction is not only arbitrary—it depends on what one puts on the axes of the production-function diagram and what is built into the curvature of the production surface; it is also quite unimportant. One can think of the phenomenon as one will—nothing will change.

[38] The fact that the "hidden scarce factor" view is heuristically useful does not, however, strengthen its pretension to status as a hypothesis about reality.

[39] More precisely, the "next" firm in line could not break even. This takes care of discontinuity.

At any rate, no serious damage is done to the statical system by decreasing returns to scale. When it is a matter of actually computing a maximum problem the loss of linearity is painful, but the trouble is in the mathematics.[40]

8. There is one kind of complication that does vitiate the results. We have assumed throughout that there exists no *direct* interaction among producers, among households, and between producers and households—that there are no (nonpecuniary) external economies or diseconomies of production and consumption. The assumption is reflected in four characteristics of the production functions and the preference functions:

a. The output of apples was assumed uniquely determined by the quantities of land and labor applied to apple production—A was assumed insensitive to the inputs and outputs of the nut industry; similarly for nuts. This voids the possibility that the apple production function might shift as a consequence of movements along the nut production function, *i.e.*, that for given D_A and L_A, A may vary with N, L_N and D_N. The stock example of such a "technological external economy" (or diseconomy) is the beekeeper whose honey output will increase, other things equal, if the neighboring apple producer expands *his* output (hence his apple blossom "supply").[41] The very pastoral quality of the example suggests that in a statical context such direct interaction among producers—interaction that is not reflected by prices—is probably rare. To the extent that it does exist, it reflects some "hidden" inputs or outputs (*e.g.*, apple blossoms), the benefits or costs of which are not (easily) appropriated by market institutions.

It should be emphasized that the assertion that such phenomena are empirically unimportant is defensible only if we rule out nonreversible dynamical phenomena. Once we introduce changes in knowledge, for example, or investment in changing the quality of the labor force via training, "external" effects become very important indeed.[42] But on our

[40] It should perhaps be repeated, however, that there remains considerable ambiguity about how the imbalance between income and outlay in decreasing-returns-to-scale situations is best treated in a general equilibrium setup.

[41] The other type of externality treated in the neoclassical literature, the type Jacob Viner labeled "pecuniary," does not in itself affect the results. It consists in sensitivity of input prices to industry output, though not to the output of single firms. External pecuniary economies (as distinct from diseconomies) do, however, signal the existence of either *technological* external economies of the sort discussed here, or of internal economies among supplier firms. These last reflect increasing returns to scale along production functions—a most troublesome state discussed at length in Part V.

[42] The full "benefits" of most changes in "knowledge," of most "ideas," are not easily captured by the originator, even with strong patent and copyright protection. If, then, the energy

stratospheric level of abstraction such considerations are out of order.

b. The "happiness" of X, as measured by U_X, was assumed uniquely determined by his own consumption of apples and nuts. He was permitted no sensitivity to his neighbor's (Y's) consumption, and vice versa. This rules out not only Veblenesque "keeping up with . . . " effects, but such phenomena as Y tossing in sleepless fury due to X's "consumption" of midnight television shows; or X's temperance sensibilities being outraged by Y's quiet and solitary consumption of Scotch. Nobody with experience of a "neighborhood" will argue that such things are illusory, but it is not very fruitful to take account of them in a formal maximizing setup.[43]

c. X and Y were assumed insensitive, also, to the input-output configuration of producers, except as this affected consumption choices. Insensitivity to the allocation of their own working time is subsumed in the "Austrian" assumption, but more is required. Y's wife must not be driven frantic by factory soot, nor X irritated by an "efficiently" located factory spoiling his view.

d. There is still a fourth kind of externality: X's satisfaction may be influenced not only by his own job, but by Y's as well. Many values associated with job-satisfaction—status, power, and the like—are sensitive to one's *relative* position, not only as consumer, but as supplier of one's services in production. The "Austrian" assumption whereby U_X and U_Y are functions only of consumption possibilities, voids this type of interaction also.

Could direct interaction phenomena be introduced into a formal maximizing system, and if so, at what cost? As regards the analytical solubility of some maximum-of-W problem, there is no necessary reason why not. The mathematics of proving the existence or nonexistence of a "solution," or of a unique and stable "solution," or the task of devising a computational routine that will track down such a solution should one exist, may become unmanageable. But the problem need not be rendered meaningless by such phenomena.

Unfortunately that is saying very little indeed, except on the level of metaphysics. Those qualities of the system that are of particular interest to the economist—(i) that the solution implies a series of "efficiency

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and resources devoted to "creating new knowledge" are sensitive to private cost-benefit calculation, some potential for social gain may well be lost because such calculation will not correctly account for cost and benefit to society at large. All this is complicated by the peculiarity of "knowledge" as a scarce resource: unlike most other scarcities, just because there is more for you there is not necessarily less for me. As for training of labor: the social benefit accrues over the lifetime services of the trainee; the private benefit to the producer accrues until the man quits to go to work for a competitor.

[43] For an important exception, however, see fn. 44 below.

conditions," the Pareto marginal-rate-of-substitution conditions, which are necessary for the maximum of a wide variety of *W*-functions, and (ii) that there exists a correspondence between the optimal values of the variables and those generated by a system of (perfect) market institutions *cum* redistribution—those qualities are apt either to blur or vanish with "direct interaction." Most varieties of such interaction destroy the "duality" of the system: the constants embedded in the maximum problem, if any, lose significance as prices, wages, rents. They will not correctly account for all the "costs" and "benefits" to which the welfare function in hand is sensitive.[44]

In general, then, most formal models rule out such phenomena. There is no doubt that by so doing they abstract from some important aspects of reality. But theorizing consists in just such abstraction; no theory attempts to exhaust all of reality. The question of what kinds of very real complications to introduce into a formal maximizing setup has answers only in terms of the strategy of theorizing or in terms of the requirements of particular and concrete problems. For many purposes it is useful and interesting to explore the implications of maximizing in a "world" where no such direct interactions exist.

V. *Relaxing the Curvature Assumptions: Kinks and Nonconvexities*

None of the above qualifications and generalizations violate the fundamentally neoclassical character of the model. What happens if we relinquish some of the nice curvature properties of the functions?

1. We required that the production functions and the indifference curves have well-defined and continuous curvatures—no sharp corners or kinks such as cause indeterminacy in marginal rates of substitution. Such smooth curvatures permit the use of the calculus, hence are mathematically convenient for larger than 2 by 2 by 2 models. They are, however, not essential to the economic content of the results. The analysis has been translated—and in part independently re-invented—for a world of flat-faced, sharp-cornered, production functions: Linear programming, more formally known as activity analysis, is the resulting

[44] It should not be concluded, however, that the different types of direct interaction are all equally damaging. All will spoil market performance, almost by definition; but some, at least, permit of formal maximizing treatment such as will yield efficiency conditions analogous to those of Part I—conditions that properly account for full social costs and benefits. So-called "public goods," *e.g.*, national defense, which give rise to direct interaction since by definition their consumption is joint—more for X means not less but more for Y—are an important example. Maximizing yields MRS conditions that bear intriguing correspondence to those which characterize ordinary private-good situations. But these very MRS conditions serve to reveal the failure of duality. (Samuelson's is again the original and definitive treatment. See citation [12].)

body of theory.[45] All the efficiency conditions have their counterparts in such a system, and the existence of implicit "prices" embedded in the maximum problem is, if anything, even more striking.[46]

2. Easing of the neoclassical requirement that functions be smooth is not only painless; in the development of analytical economics it has resulted in exciting new insights. Unfortunately, however, the next step is very painful indeed. In our original assumptions we required that returns to scale for proportional expansion of inputs be constant (or at least nonincreasing) and that isoquants and indifference curves be "convex to the origin." These requirements guarantee a condition that the mathematicians call *convexity*. The violation of this condition, as by allowing increasing returns to scale in production—due, if you wish, to the inherent physics and topography of the universe or to lumpiness and indivisibilities—makes for serious difficulties.

The essence of convexity, a concept that plays a crucial role in mathematical economics, is rather simple. Take a single isoquant such as MM in Figure 8a. It denotes the minimum inputs of L and D for the production of 100 apples, hence it is just the boundary of all technologically feasible input combinations that can produce 100 apples. Only points on MM are both feasible and technologically *efficient*, but any point within the shaded region is *feasible:* nobody can prevent me from wasting L or D. On the other hand, no point on the origin side of MM is feasible for an output of 100 apples: given the laws of physics, etc., it is impossible to do better. *Mathematical convexity obtains if a straight line connecting any two feasible points does not anywhere pass outside the set of feasible points.* A little experimentation will show that such is the case in Figure 8a. In Figure 8b, however, where the isoquant is of "queer" curvature—MRS of L for D increases—the line connecting, *e.g.*, the feasible points γ and ϕ does pass outside the "feasible" shaded area. Note, incidentally, that an isoquant of the linear programming variety, as in Figure 8c, is "convex"—this is why the generalization of (1) above was painless.[47]

What kind of trouble does nonconvexity create? In the case of concave-to-the-origin isoquants, *i.e.*, nonconvex isoquants, the difficulty is

[45] Isoquants in such a setup consist of linearly additive combinations of processes, each process being defined as requiring absolutely fixed input and output proportions. This gives isoquants that look like that in Figure 8c.

[46] A little diagrammatic experimentation will show that the geometric techniques of Part I remain fully adequate.

[47] It is important not to confuse mathematical convexity with curvature that appears "convex to the origin." Mathematical convexity is a property of *sets* of points, and the set of feasible output points bounded by a production-possibility curve, for instance, is convex if and only if the production-possibility curve itself is "*concave* to the origin" (or a straight line). Test this by the rule which defines convexity.

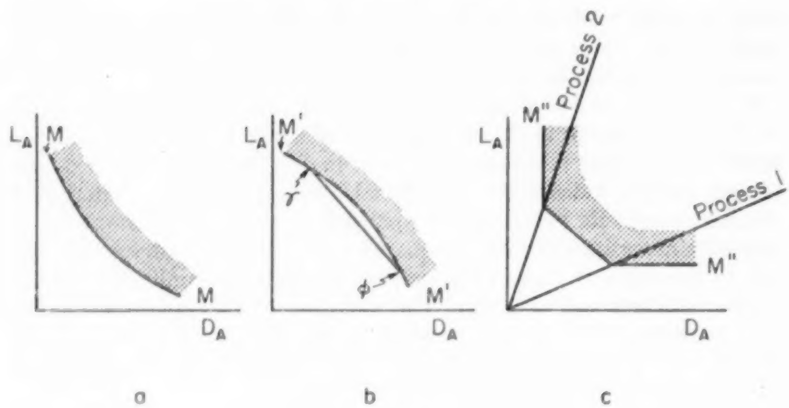

FIGURE 8

easy to see. Look back at Figure 1 and imagine that the old nut-isoquants are really those of apple producers, hence oriented to the southwest, and vice versa for nuts. Examination of the diagram will show that the locus of tangencies, FF, is now a locus of minimum combinations of A and N. Hence the rule that MRS's be equalized will result in input combinations that give a minimum of N for specified A.[48]

3. This is not the occasion for extensive analysis of convexity problems. It might be useful, however, to examine one very important variety of nonconvexity: increasing returns to scale in production. Geometrically, increasing returns to scale is denoted by isoquants that are closer and closer together for outward movement along any ray from

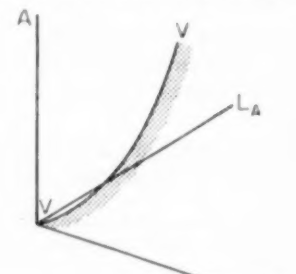

FIGURE 9

[48] A minimum, that is, subject to the requirement that no input be "wasted" from an engineering point of view, *i.e.*, that each single producer be on the production function as given by the engineer.

the origin: to double output, you less than double the inputs. Note that the isoquants still bound convex sets in the *LD* plane (they are still as in Figure 8a). But in the third or output dimension of a two-input, one-output production surface, slices by vertical planes through the origin perpendicular to *LD* will cut the production surface in such a way as to give a boundary such as *VV* in Figure 9. It is evident that *VV* bounds a nonconvex set of feasible points, so the full three-dimensional set of feasible input-output points is not convex.

The effect of such nonconvexity in input-output space can be classified with respect to its possible implications for (a) the slopes of producers' average cost (*AC*) curves; (b) for the slopes of marginal cost (*MC*) curves; (c) for the curvature of the production-possibility curve.

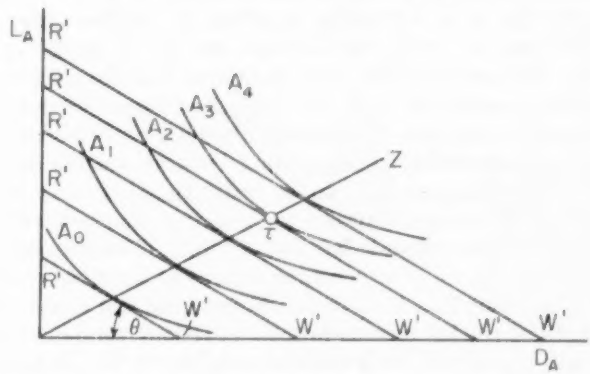

FIGURE 10

a. *Increasing returns to scale and* AC *curves.* It is a necessary consequence of increasing returns to scale that at the maximal configuration of inputs, outputs and input prices, producers' *AC* curves decline with increasing output. By the definition of increasing returns to scale at a given point τ of a production function, successive isoquants in the neighborhood of τ lie closer and closer together for movement "northeast" along the ray from the origin through τ (*Z* in Figure 10). As Figure 10 is drawn, the ray *Z* happens also to correspond to an expansion path for the particular r/w ratio denoted by the family of isocost lines $R'W'$: each $R'W'$ is tangent to an isoquant along *Z*. Given $r/w = |\text{tangent } \theta|$, a profit-maximizing apple producer will calculate his minimum total cost for various levels of output from input-output points along *Z*. But along *Z* the equal cost $R'W'$ tangents in the neighborhood of τ lie closer and closer together for increasing output, as do the isoquants. This implies that the increase in total cost for equal

successive increments in output declines. *Ergo*, the AC curve at τ for $r/w = |\text{tangent } \theta|$ must be falling.

Suppose the expansion path for $r/w = |\text{tangent } \theta|$ happened not to correspond to the ray Z, but only to cross it at τ. The intersection of A_4 with Z would not then mark the minimum-cost input-mix for an output of A_4, hence the increase in minimized total cost between A_3 and A_4 would be even less than in Figure 10: the negative effect on AC would be reinforced. The point is, simply, that if for movement along a ray from the origin cost per unit of output declines, AC will decline even more should production at minimized total cost call for changes in the input-mix, *i.e.*, departure from the ray Z.

What, then, if the maximum-of-W input-output combination required of this particular producer is denoted by the point τ? It has just been shown that AC at τ is falling. A falling AC implies a marginal cost curve (MC) that lies *below* the average. But if τ is the Ω'''-point, the shadow-p_A will just equal MC of τ. It follows that the maximum-of-W configuration requires $p_A < AC$, *i.e.*, perpetual losses. Losses, however, are incompatible with real life (perfect) markets; hence where increasing returns to scale prevails correspondence between market-directed and W-maximizing allocation fails. In an institutional context where producers go out of business if profits are negative, markets will not do.[49]

Increasing returns to scale has also a "macro" consequence that is associated with $p < AC$. For constant returns to scale, we cited Euler's theorem as assuring that total factor incomes will just equal total value of output. In increasing-returns-to-scale situations, total imputed factor incomes will exceed the total value of output: $rD + wL > p_A A + p_N N$.[50]

b. *Increasing returns to scale and* MC *curves.* Where nonconvexity of the increasing-returns-to-scale variety results in falling AC curves, real-life (perfect) markets will fail. What of a Lange-Lerner socialist bureaucracy, where each civil-servant plant-manager is instructed to maximize his algebraic profits in terms of centrally quoted "shadow" prices regardless of losses? Will such a system find itself at the maximum-of-W configuration?

It may or may not. If AC is to fall, MC must lie below AC, but at the requisite Ω-output, MC's may nevertheless be rising, as for example at ϵ in Figure 11. If so, a Lange-Lerner bureaucracy making input and output decisions as atomistic "profit-maximizing" competitors but ignoring losses will make the "right" decisions, *i.e.*, will "place" the sys-

[49] Needless to say, comments on market effectiveness, throughout this paper, bear only on the analogue-computer aspects of price-market systems. This is a little like talking about sexless men, yet it is surely of interest to examine such systems viewed as mechanisms pure and simple.

[50] The calculus-trained reader can test this for, say, a Cobb-Douglas type function: $A = L_A^{\alpha} D_A^{\beta}$, with $(\alpha + \beta) > 1$ to give increasing returns to scale.

tem at the maximum-of-W. Each manager equating his marginal cost to the centrally quoted shadow price given out by the maximum-of-W solution, will produce precisely the output required by the Ω-configuration. By the assumption of falling AC's due to increasing returns to scale either one or both industries will show losses, but these are irrelevant to optimal allocation.[51]

What if for a maximum-of-W producers are required to produce at points such as ϵ', where $p = MC$ but MC is declining?[52] The fact that ϵ' shows $AC > MC = p$, hence losses, has been dealt with above. But more is involved. By the assumption of a falling MC-curve, the horizon-

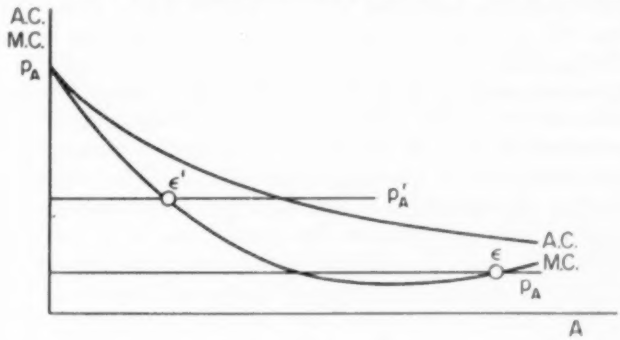

FIGURE 11

tal price line at ϵ' cuts the MC curve from below, hence profit at ϵ' is not only negative: it is at a ***minimum***. A "real-life" profit maximizer would certainly not remain there: he would be losing money by the minute. But neither would a Lange-Lerner bureaucrat under instruction to maximize algebraic profits. He would try to increase his output: "extra" revenue (p_A) would exceed his MC by more and more for every additional apple produced. In this case, then, not only would real life markets break down; so would simple-minded decentralized maximizing of profits by socialist civil servants.[53]

Paradoxically enough, the correct rule for all industries whose MC is

[51] There is an ambiguity of language in the above formulation. If at the maximum-of-W configuration losses prevail, the maximum profit position "in the large" will be not at $p = MC$ but at zero output. Strictly speaking, a Lange-Lerner bureaucracy must be instructed to equate marginal cost to price or profit-maximize "in the small" without regard to the absolute value of profit. "Make any continuous sequence of small moves that increase algebraic profits, but do not jump to the origin." It is precisely the ruling-out of the zero-output position, unless called for by $MC > p$ everywhere, that distinguishes Lange-Lerner systems from "real-life" perfect markets, both viewed as "analogue computers."

[52] This would necessarily be the case, for instance, with Cobb-Douglas type increasing returns-to-scale functions. Such functions imply ever falling MC curves, for whatever r/w ratio.

[53] Note that a falling MC curve is simply a reflection of nonconvexity in the total cost curve.

falling at the Ω-point is: "minimize your algebraic profits." But no such rule can save the decentralized character of the Lange-Lerner scheme. In a "convex" world the simple injunction to maximize profits in response to centrally quoted prices, together with raising (lowering) of prices by the responsible "Ministries" according to whether supply falls short of (exceeds) demand, is all that is needed.[54] Nobody has to know *ex ante*, *e.g.*, the prices associated with the Ω-point. In fact the scheme was devised in part as a counter to the view that efficient allocation in a collectivized economy is impossible due simply to the sheer administrative burden of calculation. With increasing returns to scale, however, the central authority must evidently know where MC's will be falling, where rising: it must know, before issuing any instructions, all about the solution.

c. *Increasing returns to scale and the production-possibility curve.* What is left of "duality"? Real-life markets and unsophisticated Lange-Lerner systems have both failed. Yet it is entirely possible, even in situations where the Ω-constellation implies $AC>MC$ with declining MC, that the maximizing procedure of Part I remains inviolate, and that the constants embedded in the maximum problem retain their price-like significance. To see this we must examine the effect of increasing returns to scale on the production-possibility curve. There are two possible cases:

i. It is possible for both the apple and the nut production functions to exhibit increasing returns to scale, yet for the implied production-possibility curve to be concave to the origin, *i.e.*, mathematically convex (as in Figure 2). While a proportional expansion of L_A and D_A by a factor of two would more than double apple output, an increase in A at the expense of N will, in general, not take place by means of such proportional expansion of inputs. Examination of FF in Figure 1 makes this clear for the constant-returns-to-scale case. As we move from any initial point on FF toward more A and less N, the L_A/D_A and L_N/D_N proportions change.[55]

The point is that if, as in Figure 1, land is important relative to labor in producing apples, and vice versa for nuts, expansion of apple production will result in apple producers having to use more and more of the relatively nut-prone input, labor, in proportion to land. Input proportions in apple production become less "favorable." The opposite is true of the input proportions used in nuts as nut production declines. This

[54] Not quite all. Even in a statical context, the lump-sum income transfers called for by Ω require central calculation. And if adjustment paths are explicitly considered, complex questions about the stability of equilibrium arise. (*E.g.*, will excess demand always be corrected by raising price?)

[55] Only if FF should coincide with the diagonal of the box will proportions not change. Then increasing returns to scale would necessarily imply an inward-bending production-possibility curve.

phenomenon explains why with constant returns to scale in both functions the production-possibility curve shows concave-to-the-origin curvature. Only if FF in Figure 1 coincides with the diagonal: *i.e.*, if the intrinsic "usefulness" of L and D is the same in apple production as in nut production, will $F'F'$ for constant returns to scale be a straight line.

The above argument by proportions remains valid if we now introduce a little increasing returns to scale in both functions by "telescoping" each isoquant successively farther towards the origin. In fact, as long as the FF curve has shape and curvature as in Figure 1, the production-possibility curve, $F'F'$ in Figures 2 and 5, will retain its convexity.

In this "mild" case of increasing returns to scale, with a still convex production-possibility curve, the previous maximizing rules give the correct result for a maximum-of-W. Further, the constants embedded in the maximum problem retain their meaning. This is true in two senses: (1) They still reflect marginal rates of substitution and transformation. Any package of L, D, A and N worth \$1 will, *at the margin*, be just convertible by production and exchange into any other package worth \$1, no more, no less: a dollar is a dollar is a dollar. . . .[56] (2) The total value of maximum-welfare "national" output: $p_A A + p_N N$, valued at these shadow-price constants, will itself be at a maximum. A glance at Figure 5 makes this clear: at the price-ratio denoted by the line $P'_A P'_N$, Ω' is the point of highest output-value. As we shall see, this correspondence between the maximum welfare and "maximum national product" solutions is an accident of convexity.

ii. It is of course entirely possible that both production functions exhibit sufficiently increasing returns to scale to give, for specified totals of L and D, a production-possibility curve such as $F''F''$ in Figure 12.[57] This exhibits nonconvexity in output space. What now happens to the results?

If the curvature of $F''F''$ is not "too sharp," the constants given out by the maximum-of-W problem retain their "dollar is a dollar" meaning. They still reflect marginal rates of substitution in all directions. But maximum W is no longer associated with maximum shadow-value of output. A glance at Figure 12 confirms our geometric intuition that in situations of nonconvex production possibilities the bliss point coincides with a minimized value-of-output. At the prices implied, as denoted by $|\tan \psi|$, the assumed Ω-point ρ is a point of minimum $p_A A + p_N N$.[58]

[56] For the infinitesimal movements of the calculus.

[57] Try two functions which are not too dissimilar in "factor intensity."

[58] For $p_A/p_N = |\text{tangent } \psi|$, $(p_A A + p_N N)$ is at its maximum at the intersection of $F''F''$ with the A-axis. Recall, incidentally, that in situations of falling MC producers were required to ***minimize*** profits.

But with nonconvexity in output space, matters could get much more complicated. If the production-possibility curve is *sharply* concave outward, relative to the indifference curves, it may be that the "minimize profits" rule would badly mislead, even if both industries show declining MC's. Take a one-person situation such as in Figure 13. The production-possibility curve $F'''F'''$ is more inward-bending than the indifference curves (U), and the point of tangency Δ is a point of

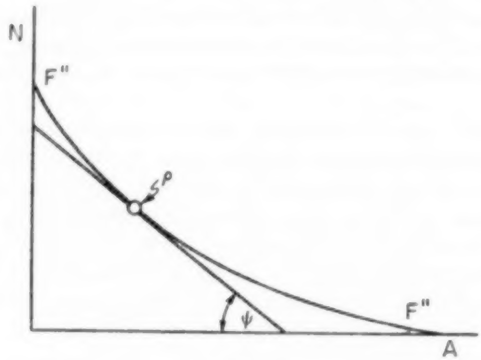

FIGURE 12

minimum satisfaction. Here, unlike above, you should rush away from Δ. The maximum welfare position is at Δ'—a "corner tangency" is involved. The point is that in nonconvex situations *relative* curvatures are crucial: tangency points may as well be minima as maxima.[59]

[59] Recall that in our discussion of Part IV corner-tangencies were important in situations where no feasible internal tangencies existed. Here there exist perfectly good and feasible internal tangencies—but they are loci of minima rather than maxima. The second-order conditions, expressed as inequalities, constitute the crucial test of optimal allocation.

It is tempting, but a mistake, to think that there is a unique correspondence between the curvature of the production-possibility curve, and the relative slopes of the nut and apple MC curves. It is true that the $[MC_A/MC_N]$ ratio associated with a point such as Ω' in Figure 5 must be smaller than $[MC_A/MC_N]$ at any point of *more* A and *less* N on $F'F'$ (*e.g.*, δ): the absolute slope of $F'F'$ has been shown to equal $pA/p_N=[MC_A/MC_N]$, and at Ω' the slope is less steep than at δ. It is also true that along a nonconvex production-possibility curve, such as that of Figure 12, an increase in A and a decrease in N are associated with a *decline* in $[MC_A/MC_N]$. But it does not follow, *e.g.*, in the first case of Figure 5, that at Ω' MC_A must be rising for an increase in A sufficiently to offset a possibly falling MC_N. (Remember, in moving from Ω' to δ we move to the right along the A-axis but to the left along the N-axis.) For any departure from Ω' will, in general, involve a change in input shadow-prices, hence *shifts* in the MC curves, while the slopes of the curves at Ω' were derived from a total cost curve calculated on the basis of the given, constant, Ω-values of w and r. The point is that cost curves are partial-equilibrium creatures, evaluated at *fixed* prices, while movement along a production-possibility curve involves a general-equilibrium adjustment that will *change* input prices. Hence it is entirely possible that at say Ω', in Figure 5, both MC_N and MC_A are falling, though $F'F'$ is convex.

So much for nonconvexity. In its mildest form, if isoquants and indifference curves retain their normal curvature and only returns to scale "increase," nonconvexity need not violate the qualitative characteristics of the maximum-of-W problem. The marginal-rate-of-substitution conditions may well retain their validity, and the solution still could give out a set of shadow prices, decentralized responses to which result in the maximal configuration of inputs, outputs and commodity distribution. But certain nonmarginal *total* conditions for effective real-life market functioning, *e.g.*, that all producers have at least to break

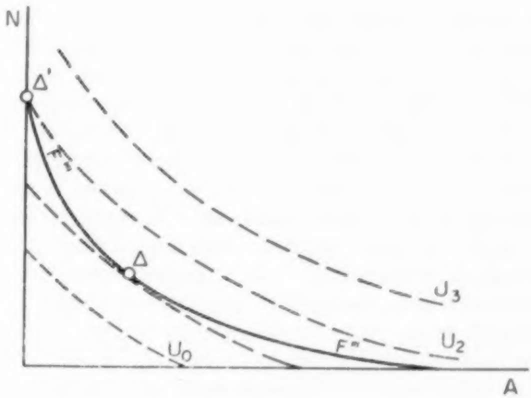

FIGURE 13

even, are necessarily violated. The shortcoming is in market institutions: the maximum-of-W solution requires such "losses." The important moral is that where increasing returns to scale obtains, an idealized price system is not an effective way to raise money to cover costs. It may, however, still be an effective device for the rationing of scarcities.[60]

VI. *Dynamics*

We have examined in some detail what conditions on the allocation and distribution of inputs and outputs can be derived from the maximization of a social welfare function which obeys certain restrictions.[61] We

[60] No mention has been made of the case that is perhaps most interesting from an institutional point of view: production functions that show increasing returns to scale initially, then decreasing returns as output expands further. No profit-seeking firm will produce in the first stage, where AC is falling, and A_Ω and N_Ω may only require one or a few firms producing in the second stage. If so, the institutional conditions for perfect competition, very many firms, will not exist. One or a few firms of "efficient" scale will exhaust the market. This phenomenon lies at the heart of the monopoly-oligopoly problem.

[61] See fn. 11.

have done so, however, using a statical mode of analysis and have ignored all the "dynamical" aspects of the problem. To charge that such statical treatment is "unrealistic" is to miss, I think, the essential meaning and uses of theorizing. It is true, however, that such treatment buries many interesting problems—problems, moreover, some of which yield illuminating insight when subjected to rigorous analysis. Full dynamical extension is not possible here, but some indication of the directions which such extension might take is perhaps warranted:

1. The perceptive reader will have noticed that very little was said about the dimensions of A, N, L_A, D_A, L_N, and D_N. The static theory of production treats outputs and inputs as instantaneous time rates, "flows"—apples per day, labor-hours per week, etc. This ignores the elementary fact that in most production processes outputs and the associated inputs, and the various inputs themselves, are not simultaneous. Coffee plants take five years to grow, ten-year-old brandy has to age ten years, inputs in automobile manufacture have to follow a certain sequence, it takes time to build a power station and a refinery (no matter how abundantly "labor and land" are applied). One dynamical refinement of the analysis, then, consists in "dating" the inputs and resultant outputs of the production functions, relative to each other. In some instances only the ordinal sequence is of interest; in others, absolute elapsed time, too, matters—plaster has to dry seven days before the first coat of paint is applied.

2. Another characteristic of production, on this planet at least, is that service flows are generated by stocks of physical things which yield their services only through time. Turret-lathe operations can be generated only by turret-lathes and these have congealed in them service flows which cannot be exhausted instantaneously but only over time. In a descriptive sense, a turret-lathe's services of today are "joint" and indivisible from some turret-lathe's services of tomorrow. Strictly speaking, this is true of most service flows. But some things, like food, or coal for heating, or gasoline, exhaust their services much faster than, *e.g.*, steamrollers, drill presses, buildings, etc. The stock dimension of the former can be ignored in many problems; this is not true of the latter set of things, which are usually labeled as fixed capital.[62] A second dynamical extension, then, consists in introducing stock-flow relationships into the production functions.

3. Lags and stock-flow relations are implied also by the goods-in-process phenomenon. Production takes place over space, and transport

[62] Much depends on arbitrary or special institutional assumptions about how much optimization we leave in the background for the "engineer." For example, machines of widely varying design could very likely yield a given kind of service. "A lathe is not a lathe is. . . ." Further, no law of nature precludes the rather speedy using-up of a lathe—by using it, *e.g.*, as scrap metal. In some situations it could even be economic to do so.

takes time, hence seed cannot be produced at the instant at which it is planted, nor cylinder heads the moment they are required on the assembly line. They have to be in existence for some finite time before they are used.

4. One of the crucial intertemporal interrelations in allocation and distribution in a world where stocks matter and where production takes time, is due to the unpleasant (or pleasant) fact that the inputs of any instant are not manna from heaven. Their supply depends on past output decisions. Next year's production possibilities will depend, in part, on the supply of machine tools; this, in turn, partly depends on the resources devoted this year to the construction of new machine tools. This is the problem of investment. From today's point of view investment concerns choice of *outputs*; but choice of what kinds and amounts of machines to build, plants to construct, etc., today, makes sense only in terms of the *input-uses* of these things tomorrow. Input endowments, L and D, become unknowns as well as data.

5. Tomorrow's input availabilities are also affected by how inputs are used today. The nature and intensity of use to which machines are subjected, the way in which soil is used, oil wells operated, the rate at which inventories are run down, etc., partly determine what will be left tomorrow. This is the problem of physical capital consumption, wear and tear, etc.—the problem of what to subtract from gross investment to get "net" capital formation, hence the net change in input supplies.

How do these five dynamical phenomena fit into the maximum-of-welfare problem? Recall that our W-function was assumed sensitive to, and only to, X's and Y's consumption. Nothing was said, however, about the timing of such consumption. Surely not only consumption of this instant matters. In a dynamic context, meaningful welfare and preference functions have to provide a ranking not only with respect to all possible current consumption mixes but also for future time. They must provide some means for weighing apples next week against nuts and apples today. Such functions will *date* each unit of A and N, and the choice to be made will be between alternative time-paths of consumption.[63]

Given such a context, the above five dynamical phenomena are amenable to a formal maximizing treatment entirely akin to that of Parts I, II and III. They are, with one qualification,[64] consistent with

[63] Note how little weight is likely to be given to current consumption relative to future consumption if we pick short unit-periods. This year certainly matters, but what of this afternoon versus all future, or this second? Yet what of the man who knows he'll die tomorrow? Note also the intrinsic philosophical dilemmas: *e.g.*, is John Jones today the "same" person he was yesterday?

[64] Capital is characterized not only by the fact of durability, but also by lumpiness or indivisibility "in scale." Such lumpiness results in nonconvexity, hence causes serious analytical troubles.

the convexity assumptions required for solubility and duality. The results, which are the fruit of some very recent and pathbreaking work by R. M. Solow and P. A. Samuelson (soon to be published), define intertemporal production efficiency in terms of time-paths along which no increase in the consumption of any good of any period is possible without a decrease in some other consumption. Such paths are characterized by the superimposition, on top of the statical, one-period or instantaneous efficiency conditions, of certain intertemporal marginal-rate-of-substitution requirements. But the statical efficiency requirements retain their validity: for full-fledged dynamical Pareto-efficiency it is necessary that at any moment in time the system be on its one-period efficiency frontier.[65]

Incidentally, the geometric techniques of Part I are fully adequate to the task of handling a Solow-Samuelson dynamical setup for a 2 by 2 by 2 world. Only now the dimensions of the production box and hence the position of the production-possibility curve will keep shifting, and the solution gives values not only for inputs, outputs and prices but also for their period-to-period changes.

There are many dynamical phenomena less prone to analysis by a formal maximizing system than the five listed above. The qualitative and quantitative supply of labor-input in the future is influenced by the current use made of the services of people.[66] There are, also, important intertemporal interdependences relating to the fact of space—space matters because it takes time and resources to span it. Moreover, we have not even mentioned the really "difficult" phenomena of "grand dynamics." Production functions, preference functions, and even my or your welfare function shift over time. Such shifts are compounded by what in a sense is the central problem of nonstationary dynamics: the intrinsic uncertainty that attaches to the notion of future.[67] Last, the very boundaries of economics, as of any discipline, are intrinsically arbitrary. Allocation and distribution interact in countless ways with the politics and sociology of a society . . . "everything depends on everything." But we are way beyond simple analytics.

A Historical Note on the Literature

Note: For a short but substantive history of the development of thought in this field, the reader is referred to Samuelson's synthesis (nonmathematical), pp. 203–19 of *Foundations* [1].

[65] For possible exception to this, due to sensitivity of the volume of saving, hence of investment, to "as imputed" income distribution, *cf.* my "On Capital Productivity, Input Allocation and Growth," *Quart. Jour. Econ.*, Feb. 1957, LXXI, 86–106.

[66] Although labor is in many respects analytically akin to other kinds of physical capital—resources can and need be invested to expand the stock of engineers, as to expand that of cows and machines. Machines, however, are not subject to certain costless "learning" effects.

[67] While formal welfare theory becomes very silent when uncertainty intrudes, much of economic analysis—*e.g.*, monetary theory, trade fluctuations—would have little meaning except for the fact of uncertainty.

See also Bergson, "Socialist Economics," *Survey of Contemporary Economics*, Vol. I [2] and Boulding, "Welfare Economics," *Survey*, Vol. II [3].

The foundations of modern welfare theory are well embedded in the soil of classical economics, and the structure, too, bears the imprint of the line of thought represented by Smith, Ricardo, Mill, and Marshall. But in classical writing prescription and analysis are inseparably intertwined, the underlying philosophy is unabashedly utilitarian, and the central normative concern is with the efficacy of market institutions. In contrast, the development of modern welfare economics can best be understood as an attempt to sort out ethics from science, and allocative efficiency from particular modes of social organization.

The classical tradition reached its culmination in Professor Pigou's *Wealth and Welfare* [4]. Pigou, the last of the great premoderns was also, as witness the *Economics of Welfare* [5], among the first of the moderns. But he was not the first. Vilfredo Pareto, writing during the first years of the century, has a pre-eminent claim [6]. It is his work, and Enrico Barone's after him [7]—with their focus on the analytical implications of maximization—that constitute the foundations of the modern structure. Many writers contributed to the construction, but A. P. Lerner, Abram Bergson, and Paul Samuelson come especially to mind [8]. Bergson, in particular, in a single article in 1938, was the first to make us see the structure whole. More recently, Kenneth Arrow has explored the logical underpinnings of the notion of a social welfare function in relation to social choice [9]; T. C. Koopmans, Gerard Debreu and others have tested more complicated systems for duality [10]; Samuelson has developed a meaningful species of social indifference function [11] and derived efficiency conditions for "public goods" [12]; and Robert Solow and Samuelson, in work soon to be published, have provided a dynamical extension [13, 14].

There is, also, an important modern literature devoted to the possible uses of the structure of analysis for policy prescription. Three separate sets of writings are more or less distinguishable. There was first, in the 'twenties and 'thirties, a prolonged controversy on markets versus government. L. von Mises [15] and later F. A. Hayek [16] were the principal proponents of unadulterated *laissez faire*, while H. D. Dickinson, Oscar Lange, Lerner and Maurice Dobb stand out on the other side [17]. The decentralized socialist pricing idea, originally suggested by Barone and later by F. M. Taylor, was elaborated by Lange to counter the Mises view that efficient allocation is impossible in a collectivized economy due simply to the sheer scale of the administrative burden of calculation and control.

Second, in the late 1930's, Nicholas Kaldor [18] and J. R. Hicks [19] took up Lionel Robbins' [20] challenge to economists not to mix ethics and science and suggested a series of tests for choosing some input-output configurations over others independently of value.[68] Tibor Scitovsky pointed out an important asymmetry in the Kaldor-Hicks test [21] and Samuelson in the end demonstrated that a "welfare-function" denoting an ethic was

[68] The Hicks-Kaldor line of thought has some ties to an earlier literature by Marshall, Pigou, Fisher, etc., on "what is income."

needed after all [22]. I. M. D. Little tried, but I think failed, to shake this conclusion [23].[69] The Pareto conditions are necessary, but never sufficient.

Third, there is a body of writing, some of it in a partial-equilibrium mode, which is concerned with policy at a lower level of abstraction. Writings by Harold Hotelling, Ragnar Frisch, J. E. Meade, W. A. Lewis, are devoted to the question of optimal pricing, marginal-cost or otherwise, in public utility (M.C.<A.C.) situations [24]. Hotelling, H. P. Wald, M. F. W. Joseph, E. R. Rolph and G. F. Break, Little, and more recently Lionel McKenzie, have, in turn, analyzed alternative fiscal devices for covering public deficits [25]. Last, a number of the above, notably Lerner, Kaldor, Samuelson, Scitovsky, Little, McKenzie and, most exhaustively, Meade, as well as R. F. Kahn, Lloyd Metzler, J. de V. Graaf, H. G. Johnson and others have applied the apparatus to questions of gains from international trade, optimal tariffs, etc. [26].

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[9] See K. J. Arrow, *Social Choice and Individual Values* (New York, 1951).

[10] P. A. Samuelson, *Market Mechanisms and Maximization* (unpublished, RAND Corporation Research Memo., 1949).

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[13] R. Dorfman, R. M. Solow and P. A. Samuelson, *Linear Programming and Economic Analysis* (RAND Corporation, forthcoming), esp. Ch. 11, 12. Ch. 14 contains a most elegant exposition by R. M. Solow of modern welfare theory in linear programming terms.

[14] Four other works should be mentioned: M. W. Reder, *Studies in the Theory of Welfare*

[69] While I find Little's alternative to a welfare function ("an economic change is desirable if it does not cause a bad redistribution of income, and if the potential losers could not profitably bribe the potential gainers to oppose it" [p. 105]) no alternative at all, his is a provocative evaluation of modern welfare theory. For an evaluation, in turn, of Little, see K. J. Arrow, "Little's Critique of Welfare Economics," *Am. Econ. Rev.*, Dec. 1951, XLI, 923–34.

Economics (New York, 1947), is a book-length exposition of modern welfare theory; Hla Mynt's *Theories of Welfare Economics* (London, 1948), treats classical and neoclassical writings; W. J. Baumol in *Welfare Economics and the Theory of the State* (London, 1952), attempts an extension to political theory; in a different vein, Gunnar Myrdal's *Political Elements in the Development of Economic Theory*, transl. by Paul Streeten (London, 1953), with Streeten's appendix on modern developments, is a broad-based critique of the premises of welfare economics.

[15] For the translation of the original 1920 article by Mises which triggered the controversy, see F. A. Hayek, ed., *Collectivist Economic Planning* (London, 1935).

[16] See esp. F. A. Hayek, "Socialist Calculation: The Competitive Solution," *Economica*, May 1940, VII, 125–49; for a broad-front attack on deviations from *laissez faire* see Hayek's polemic, *The Road to Serfdom* (Chicago, 1944).

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[25] See esp. Little, "Direct versus Indirect Taxes," *Econ. Jour.*, Sept. 1951, LXI, 577–84.

[26] For a comprehensive treatment of the issues, as well as for references, see J. E. Meade, *The Theory of International Economic Policy*, Vol. II: *Trade and Welfare* and *Mathematical Supplement* (New York, 1955).

ANTITRUST AND THE CLASSIC MODEL

By SHOREY PETERSON*

"Outsiders," wrote John Neville Keynes in introducing his *Scope and Method*, "are naturally suspicious of a science, in the treatment of which a new departure is so often and so loudly proclaimed."[1] It is a curious and disturbing fact that at the traditional center of economics—the role of markets in solving the general problem of order in economic life—new departures have been proclaimed so often.

Outsiders become aware of economics mainly when economists appraise the working of the economy or propose guides for its control; and it is here that the theory of values and markets, more than in its abstract expression, has chief impact. In the quarter-century since Chamberlin put monopoly and competition together in a single formulation, economists have stressed the prevalence of monopoly elements in markets, but have differed in interpreting this condition, especially in its bearing on policy. Commonly they relate it to pre-Chamberlin thought regarding the nature and place of competition, and bring a putative "classic" model, at least implicitly, into their discussion. In doing so they will agree that such a model describes badly how markets really work, but will often disagree as to its normative role. They may accept its guidance in defining the necessary working of markets in a free system, and then despair of the future of control through markets that do not and cannot work in that manner. Or, more likely now, they may reject the model as a false guide because our present economy seems to do very well without meeting its requirements. As substitutes for it they may rely on theories of "workable competition" and "countervailing power."

The present contention is that both of these views misrepresent earlier analysis when they deduce policy implications from models used in static theory. How wrong the deduction can be is apparent when we examine the work of such economists as John Bates Clark and Alfred Marshall who brought their theory into the practical realm. Their handling of market problems, running the gamut from static theory to policy proposals, warrants neither the pessimism nor the rejection. Indeed it would be more accurate to say that their thinking set a course

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[1] *The Scope and Method of Political Economy* (London, 1891), p. 8.

which we are still largely following, and perhaps without being much farther down the road. The senior Keynes should find merit in a fuller sense of the continuity in this development.

I. *Current Interpretations of the Earlier View of Markets*

Galbraith, for example, proceeds in his *American Capitalism* from the position that a "vast distance separates oligopoly from the competition of the competitive model." "It is a measure of the magnitude of the disaster of the old system," he says, "that when oligopoly or crypto-monopoly is assumed it no longer follows that any of the old goals of social efficiency are realized." And again: "By evolution, from a system where nearly everything worked out for the best, economists found themselves with a system where nearly everything seemed to work out for the worst."[2]

As thus stated, this view of earlier thinking may lead to a denial merely of its descriptive validity, or also of its normative worth. In *The Decline of Competition* Arthur R. Burns displayed the first of these leanings. He began by adopting the usage common since Chamberlin of employing the term competition to mean pure competition and of referring to situations departing therefrom, that is, to most markets, as noncompetitive or monopolistic. Under a variety of circumstances business firms act in light of "the effects of changes in their output, or their price policy, upon the market as a whole," and thus "find themselves in the position of a monopolist" in price and output decisions. In a context not of abstract theory but of market appraisal and policy recommendation, Burns finds it significant that "price and production policies would be expected to differ from those associated with perfect competition." In his long and impressive recital of the monopoly elements in markets, it seems to be enough to show that these elements are present—unnecessary to determine how seriously they cause price and output adjustments to depart from an acceptable norm that embraces all elements of public interest. More recently Burns has affirmed his view that, under the antitrust laws, "we have failed to achieve a competitive system at all closely resembling that which was in the minds of the economists of the last century . . . ," and presumably has indicated his conception of the earlier view when he says: "Only pure price competition can produce the results which most people have in mind when they defend what they call in general terms 'the competitive system.'"[3]

[2] J. K. Galbraith, *American Capitalism—The Concept of Countervailing Power* (Cambridge, Mass., 1952), pp. 45, 46, 51. See also Ch. 2.

[3] A. R. Burns, *The Decline of Competition* (New York, 1936), pp. 3-6, 40-41. The second reference is to his contribution to the "The Effectiveness of the Federal Antitrust Laws: a Symposium," D. M. Keezer, ed., *Am. Econ. Rev.*, June 1949, XXXIX, 691-94.

But to Galbraith the lack of fit of the competitive model has quite a different meaning. While, according to it, things should work out for the worst under present conditions, they have not done so. The American economy appears wonderfully effective. The model must thus be rejected as guide as well as description; there can be no need of promoting the competition it envisages. In Galbraith's theory the offsetting power of groups on opposite sides of the market fills the breach, and market power is thereby kept from upsetting the allocative and distributive mechanism.

The equally optimistic and more widely accepted view of present markets is that competition, to succeed as regulator, need not approach the perfection of the model—indeed, it should not do so. This is the view that is now variously formulated under the caption of "workable competition." The essence of it is that even such rivalry as prevails when competitors are few can serve quite well in assigning resources and dividing income, and is greatly superior to its improbable purer cousin in promoting productivity and progress. In developing this view Schumpeter doubted the complete success of pure competition even as a static maximizing agent, but stressed mainly that an ideal disposition of resources at a given point in time is of small consequence when compared with the development of production through time. The competition that counts is "the competition from the new commodity, the new technology, the new source of supply, the new type of organization . . . "; and for it to operate, substantial elements of market power are necessary, not only as the concomitant of requisite firm size but as steadying influences in what would otherwise be too turbulent an economic sea. The present point is that Schumpeter regarded this theory of market operation as almost completely at odds with traditional thought. Despite some recognition of monopoly, "neither Marshall and Wicksell nor the classics," he said, "saw that perfect competition is the exception and that even if it were the rule there would be much less reason for congratulation than one might think."[4]

With similar optimism respecting big-firm capitalism A. A. Berle, in his recent *The 20th Century Capitalist Revolution*, joins in the rejection of older thinking, but with his own characteristic interpretation. Under the corporate system it is not true, he says, that "competition of great units (which does exist) produces the same results as those which used to flow from competition among thousands of small producers. . . . And it is indefensibly disingenuous to assert that these operations are primarily following economic laws more or less accurately outlined by the classic economists a century ago when the fact appears to be that

[4] J. A. Schumpeter, *Capitalism, Socialism, and Democracy*, 2d ed. (New York and London, 1947), pp. 74–78 and Ch. 7, 8.

they are following a slowly emerging pattern of sociological and political laws, relevant to the rather different community demands of our time." For urging the effectiveness of competition among the giants, Sumner Slichter is put in the category of the disingenuous, "since competition within the system of corporate concentrates produces results quite different from the balanced economy expounded by Adam Smith."[5] Whatever the looseness of his history, whether of markets or of economic thought, Berle joins with Schumpeter and Galbraith in finding that present results are generally good.

Galbraith and Berle wrote for a wide audience and Schumpeter has been widely read; and their rejection for present use of a supposed classic model is now echoed in abler segments of the public press. Thus *Business Week*, under the heading "Clobbering Theory," reports the 1953 American Economic Association meetings in which Galbraith's thesis was discussed: "Classic economics teaches that only a competitive economy can be sound and prosperous. . . . But the fact is that the United States economy bears only a remote likeness to the classic picture of a competitive system—and yet it has prospered enormously. . . . "[6] And *Fortune*, in an article on "The New Competition," points out that "the word competition no longer means what it once did." It is a competition that prevails even among oligopolists and it has been a "stunning success." This competition is said to be essentially different from what competition meant "to most of the economists and experts who have until recently shaped the accepted notions of competition. . . . Competition to them is a way of life that can be defined fairly rigidly. They conceive competition in terms of the grand old original or classic model of Adam Smith and his followers."[7]

To economists trained in the 1920's and before, as this writer was—and especially to economists who have long followed the theory underlying antitrust policy—the foregoing oft-repeated view of what has happened to economics must seem mildly shocking. Contrary to this view, it would be truer to say that the trend represented by the phrase "workable competition" is a natural outgrowth of the thinking fifty years ago of such economists as J. B. Clark and Alfred Marshall. The policy conclusions objected to by workable-competition advocates really rest on the broadened definition of monopoly in much more recent theory. Some would recast earlier theory in line with this definition, but Marshall and Clark, and other theorists of realistic outlook from Adam Smith on, quite surely would have rejected the policy implica-

[5] A. A. Berle, Jr., *The 20th Century Capitalist Revolution* (New York, 1954), pp. 11–12, 43–52.

[6] January 9, 1954, pp. 93–99.

[7] June 1952, p. 99.

tions of any such reconstruction of their thought. Their conception of welfare was never confined to the norm of precise efficiency in allocation and their pratical judgments moved well beyond the narrow boundaries of static analysis.

II. *Older Thinking as to Economic Goals, Especially in a Dynamic Setting*

When economists give their main attention to a theoretical problem they are not in effect declaring that the solution of that problem meets all the requirements, or even the principal requirements, of well-being. Economists of the nineteenth century, especially the classical, Austrian, and neoclassical economists, gave their greatest effort to the problem of value. Smith, Ricardo, and the classical writers were unable to relate utility and cost meaningfully, or the values of factors and products fundamentally, and it required generations of economists to define the value conditions of economic behavior. The problem was fascinating in itself, and it seemed vital because prices were an obvious basis of action and of income in a specialized and exchanging society. A full grasp of the system-wide problem of economy in using resources, and the inherent relation of distribution to it, seems to have come only gradually, and with it a full realization of the role of a system of values in solving the general problem of order; but as thinking acquired this focus, the necessity of dealing with so complex a problem under simplified assumptions became evident. Very naturally the analysis was carried forward, especially by mathematically inclined economists, to an attempted final formulation of the condition of ideal maximization in the whole economy. The problem was worthy of the effort given it; but the inference is unwarranted that economics thereby limited its concern to a nice allocation of resources, or viewed the assumptions of allocation theory as descriptive of the real world.

The supposed need today of a new theory of economic performance, at sharp variance from the traditional, may indeed reflect some shift in emphasis among the several economic goals. There is great stress now on progress in total output, and earlier theory may have dealt inadequately with it. Schumpeter doubtless judged rightly in asserting the superiority of this objective over the niceties of assigning and rewarding factors; but he was wrong, nevertheless, in imputing neglect of it to the leading economists of earlier periods, or the advocacy by them of conditions which would impede its accomplishment. These economists seemed to think that coordination of activities through markets was the most fruitful problem for economists to attack; but most of them took it for granted that welfare depends primarily on high output and on the conditions necessary to it. Adam Smith struck the keynote in

beginning his *Inquiry into the Nature and Causes of the Wealth of Nations* with a treatment "Of the Causes of Improvement in the Productive Power of Labour . . ." and in his obviously greater concern over "Progress of Opulence" than over any model that might now be described as "grand old original or classic." J. S. Mill concluded the introduction to his *Principles* with the statement: "The laws of Production and Distribution, and some of the practical consequences deducible from them, are the subject of the following treatise." His long first Book deals with production; and when, following Books II and III on distribution and value, he passes in Book IV from the "statics of the subject" to its "dynamics," he views the progress of society largely in terms of expanding production.[8]

No one should attempt to state briefly the criteria by which Marshall was guided in the incidental appraisals that appear in his broad picture of economic organization. Advance in output is implicit as a leading element in many of his remarks on progress; but his main concern was with nothing less than the whole improvement of man. Certainly it would misrepresent him grossly to say that he thought the success of a system depended on achieving certain marginal relationships in using resources. "The main concern of economics," he said, "is thus with human beings who are impelled, for good and evil, to change and progress. Fragmentary statical hypotheses are used as temporary auxiliaries to dynamical—or rather biological—conceptions: but the central idea of economics, even when its Foundations alone are under discussion, must be that of living force and movement."[9]

In the present context John Bates Clark is the most instructive spokesman for traditional economics, since he was both an eminent expositor of neoclassical doctrine and a leading student of monopoly and antitrust policy, writing in the midst of early excitement over the threat of concentrated market power to the economic structure. In formulating in his *Distribution of Wealth* his static, perfect-market theory of factor pricing and resource use, he characterized his effort with the concluding statement that "all real knowledge of the laws of movement depends upon an adequate knowledge of the laws of rest." He saw this approach as only a part of economics since "a static state . . . is imaginary. All natural societies are dynamic; and those which we have principally to study are highly so." "A theory of disturbance and variation," he said then, would be "included in the science of eco-

[8] J. S. Mill, *Principles of Political Economy* (New York, 1883, from 5th London edition), Vol. I, p. 42; Vol. II, pp. 271–72. As to his personal choice among the tests of a good system, Mill said he could not "regard the stationary state of capital and wealth with the same unaffected aversion so generally manifested toward it by political economists of the old school" (Vol. II, p. 336).

[9] Alfred Marshall, *Principles of Economics*, 8th ed. (London, 1920), p. xv.

nomic dynamics; but the most important thing that is included in it is a theory of progress."[10] Clark essayed this larger task in his *Essentials of Economic Theory*, though only as a "provisional statement of the more general laws of progress"; and in it he set forth his views of monopoly and of related policy, as will be noted below.[11] For the moment we need only observe Clark's perspective of goals, as when he stated in his *The Control of Trusts* that " . . . progress is in itself the *summum bonum* in economics, and that society is essentially the best which improves the fastest."[12]

But it is only part of the story to see that leading economists of the past gave no special pre-eminence to the value matters they studied so thoroughly, and looked on their static hypotheses as something less than realistic description. While they stressed high and growing production, did this result not depend in their theory on a degree of competition impossible under modern conditions? Galbraith, notably, rests his criticism on this interpretation. Among "the old goals of social efficiency" he includes "getting the most for the least—the common engineering view of efficiency," together with "appropriate incentive to change—the adoption of new and more efficient methods of production"; and he lumps these production goals with those of optimum allocation and distribution in declaring that when competitors are few "it no longer follows that any of the old goals of social efficiency are realized." Indeed, for all of these goals to be reached, as Galbraith interprets the requirements of earlier theory, competition should be construed even more rigorously than was done; and he applauds the more recent economists who "began to require of competition a meaning which would cause it, in turn, to produce the economic and social consequences which earlier economists had associated with it."[13]

The opposite view seems more plausible. Only when traditional economics is thus "perfected" is it vulnerable to the charge that, by its rationale, everything should work out for the worst in modern capitalism. We should not inflict on it so damaging a refinement. It is true that competition has always been assigned a central place among the conditions of productivity and progress; it has been counted on to spur improvement, rid industries of weak producers, prevent gain through

[10] *The Distribution of Wealth* (New York, 1899), pp. 442, 31, 33.

[11] *Essentials of Economic Theory—as Applied to Modern Problems of Industry and Public Policy* (New York, 1907), p. v.

[12] *The Control of Trusts* (New York, 1901), pp. 82–83.

[13] Galbraith, *op. cit.*, pp. 16–20. Very properly Galbraith includes among the main economic goals—along with high productivity, effective allocation, and acceptable distribution—the stable high-level employment of resources. In dealing with this goal traditional economics comes off less well; but here the matter at issue is only incidentally, if at all, the competition that was assumed.

restricting performance. But the competition that serves these ends need not be perfect—in major respects it should not be—and earlier economists knew this, much as we do. Whatever the perfection formerly thought necessary for markets to perform certain allocative and distributive functions—the topic of the following section—no such condition should be read into their analysis of the more dynamic, on-moving aspects of economic performance.

Again, J. B. Clark's thinking is pertinent—a natural source for students who would link their thinking with the past. Clark did indeed insist that monopoly is decidedly "unfavorable to continued improvement in the productive arts" whereas "competition is the assured guarantee of all such progress." But Clark wrote prior to that unfortunate usage by which all that is not pure competition is labeled monopoly. By monopoly he meant unified control of a market, and by competition, in this context, "healthful rivalry in serving the public." He feared the trusts that were developing and saw that "partial monopolies" were prevalent and dangerous.[14] But he saw the advantages of large establishments and also of consolidations, including even their contributions to research and innovation, which Galbraith says was slow to be recognized. The following may summarize Clark's view:

> A vast corporation that is not a true monopoly may be eminently progressive. If it still has to fear rivals, actual or potential, it is under the same kind of pressure that acts upon the independent producer—pressure to economize labor. It may be able to make even greater progress than a smaller corporation could make, for it may be able to hire ingenious men to devise new appliances, and it may be able to test them without greatly trenching on its income by such experiments. When it gets a successful machine, it may introduce it at once into many mills. Consolidation without monopoly is favorable to progress.[15]

Thus, in the manner of Schumpeter and others, Clark was saying not merely that productivity and progress can persist in the face of an admixture of monopoly, but that within limits they are promoted positively by it. This view appeared most clearly in his appreciation of patent policy: "If an invention became public property the moment that it was made, there would be small profit accruing to any one from the use of it and smaller ones from making it. . . . This fact affords a justification for one variety of monopoly. . . . Patents are a legal device for promoting improvements, and they accomplish this by invoking the principle of monopoly which in itself is hostile to improvement." He recognized the possibility of abuses, but he sensed the principle, which

[14] *Essentials*, pp. 364, 374, 382, 533–34.

[15] *Ibid.*, p. 534.

he stated elsewhere more abstractly, that perfect competition instead of being a condition of progress would actually prevent it.[16]

There is another quite different respect in which the fullest competition is often deemed harmful and unworkable. It lies in the fact that in modern industry with its indivisibilities, fixed costs, and lumpy expansion in anticipation of demand, wholly unrestricted competition is likely to make profit-seeking too difficult, losses too prevalent, for firms to remain healthy and vigorous. This view was also common a half-century and more ago and was urged as a reason for accepting, though with misgiving, the limitations that size and combination bring. In his early work, *The Philosophy of Wealth,* Clark applauded the "conservative competition in which economists of a few years ago were able to see realized a general harmony of social interests"; and with it he contrasted "the fiercer contest in which eventual success comes to a participant through the extermination of rivals, the process well-named 'cut-throat' competition." "Easy and tolerant competition," Clark said, "is the antithesis of monopoly; the cut-throat process is the father of it."[17]

Later he provided an explanation, as we would now, in terms of fixed costs and unused capacity and the possibility that competition will drive prices down close to the level of variable costs. Such competition he pointed out, in discussing water transportation in the *Essentials,* results usually in "a merely tacit agreement to 'live and let live'"; and he thought "a normal kind of competition will stop short of the warfare which drives both rivals into bankruptcy."[18] Still later, in the second edition of *The Control of Trusts,* the situation in industry in general was explained, and the case presented and conditions set forth for "a tolerant and normal competition" under which big industry can remain vigorous.[19] This fear of wholly unrestricted competition was quite general among American economists of the period.[20] That Marshall questioned the wisdom of unlimited competition was evident both in his *Principles* and in his *Industry and Trade,* as will appear incidentally in the following section.

[16] *Ibid.*, pp. 360, 366, 373. Clark's "five organic changes," the basis of his "economic dynamics," included growth of population and of capital and changes in methods and organization of production and in consumers' wants. Shifting of production to new products did not receive separate recognition but appeared under the last heading. *Ibid.*, 203-06.

[17] *The Philosophy of Wealth* (Boston, 1886), p. 120.

[18] *Essentials*, pp. 414-15.

[19] J. B. Clark and J. M. Clark, *The Control of Trusts*, rev. ed. (New York, 1912), pp. 168-83.

[20] See, for example, A. T. Hadley, *Economics* (New York and London, 1896), Ch. 6; J. W. Jenks, *The Trust Problem*, rev. ed. (New York, 1905), pp. 140, 16-20; F. W. Taussig, *Principles of Economics*, 2d ed. (New York, 1911), Vol. II, pp. 434-36.

III. *Workability of Imperfect Competition, as Seen by Earlier Economists*

Now let us turn, in this comparison of past with present thinking, from the conditions of expanding productivity and general industrial health to the distortions commonly attributed to monopoly. To say that a system with some mixture of monopoly in its competition may do a good job in developing productive power is not to say that it escapes serious misallocation and exploitation. Much that is now claimed on behalf of a new concept of competition, supposedly different from that of the older economists, amounts to saying that our economy does so well in expanding output that we can afford to overlook the distortions. This, in part, is what Schumpeter said. But theories of "workable competition," as of "countervailing power," go further and give reasons why departures from purity in competition do little harm to price relationships. Are these reasons much different from the views of economists of fifty or more years ago? Again, the present theme is that they are not—that they differ only as more fully developed concepts differ from their origins.

To begin with, we need perspective of the place that pure competition, or whatever the "classic model" implies, had in relevant earlier thinking. A plausible conclusion, when we scan the long attack on value problems, is that particular features and degrees of competition had a much smaller place in the whole analysis, even implicitly, than is now often supposed. The main struggle of economists over a century or more was not in spelling out marginal refinements but in putting the main building blocks in some sort of order: in relating utility and cost; in recognizing other costs than labor; in seeing the broad dependence of factor prices on product prices, as well as the narrower reverse relationship; in assigning separate values to factors used in combination—all, of course, with incremental logic but with the main structure transcending the static niceties. In a society faced with vast possibilities of gross error in adapting complex resources to satisfying countless wants, formulation in value terms of the main elements of system-wide order was the goal to be sought and is the achievement now to be applauded.

In this setting the problems of allocation and distribution do not depend for their solution on a certain kind of competition; the essential solution is largely independent of the type of market. It is often said that competition is *the* regulator of a market economy; but, on the contrary, the chaos that would prevail in the absence of effective control is obviated not by competition alone but by the more general operation of the whole price mechanism. This is evident when we observe that even a monopolist can derive revenue only by producing what people will

buy, and that he is best off when he aims at the most valuable flow of products from the resources he uses. Nor can he get the most profit without employing effective techniques of production, and in other respects selecting and combining factors to best advantage. His demand enters into the total demand for each factor, and this demand, with the supply, sets the price of the factor and the cost of its use, and thus provides the essential barrier to inferior applications of it. True, his market power creates stresses that prevent full maximization from the social standpoint and his income may be greater than his performance requires. But the main elements of order are still present. A degree of competition that will keep these distortions within acceptable bounds has always been thought of as an essential part of the mechanism, but it is only a subordinate part of the whole scheme of control that the older economics explained for us.

This is elementary and is said only because lack of perspective regarding it has been common and has appeared in widely influential writing. The confusion may be explicit, as in assuming that a market economy is practically unregulated unless competition approaches perfection—or that the older economics held this to be the case. Or it may be implicit, as, for example, in Berle's contention that corporate operations are no longer guided by the market forces of traditional theory but by the mores of essentially political entities. Berle is offering a plausible theory of behavior within a limited range of decision-making; but, so far as traditional economics is concerned, he overlooks the main point, namely that the greatest corporation is still subject to the tyranny of the income statement and can prosper only as it directs production in keeping with buyer preferences and uses resources with an eye to costs determined in a setting of alternative uses.

Thus viewed, this value structure defines the broad conditions of order in a market economy even when competitors are few. But its formulators may still be charged with setting up misleading guideposts if, implicitly, they made the ultimate niceties the crux of the allocation process. This, however, does not seem to have been the case, at least among leading economists who related theory to practical issues.

In this connection also, J. B. Clark is the best example of an able theorist concerned specifically with monopoly and antitrust. Clark seems generally to have recognized the difficulties that economists of the period are now said to have ignored, and his resolution of them suggests much present thinking. In his *Essentials* he says:

> The most striking phenomenon of our time is the consolidation of independent establishments by the forming of what are usually called trusts; and this and all the approaches to it are precluded by the static hypothesis. There is a question whether, after competition has reduced

> establishments in one subgroup to a half dozen or less, they would not, even without forming a trust, act as a quasi-monopoly.[21]

He saw the danger: "What we have is neither the complete monopoly nor the merely formal one, but one that has power enough to work injury and to be a menace to industry and politics." But markets still provide protection: even when the entire product comes from a single company,

> . . . the price may conceivably be a normal one. It may stand not much above the cost of production to the monopoly itself. If it does so, it is because a higher price would invite competition. The great company prefers to sell all the goods that are required at a moderate price rather than to invite rivals into its territory. This is monopoly in form but not in fact, for it is shorn of its injurious power; and the thing that holds it firmly in check is *potential competition*. . . . Since the first trusts were formed the efficiency of potential competition has been so constantly displayed that there is no danger that this regulator of prices will ever be disregarded.[22]

But, said Clark, this "check works imperfectly. At some points it restrains the corporations quite closely and gives an approach to the ideal results, in which the consolidation is very productive but not at all oppressive; while elsewhere the check has very little power, oppression prevails, and if anything holds the exactions of the corporation within bounds, it is a respect for the ultimate power of the government and an inkling of what the people may do if they are provoked to drastic action." He was hopeful that a policy aimed at "keeping the field open for competitors" might obviate more drastic action. This would require prevention of unfair and predatory methods. "The preservation of a normal system of industry and a normal division of its products requires the suppression of all those practices of great corporations on which their monopolistic power depends."[23]

While Clark saw the possibility of quasimonopoly when competitors are few, he believed "that competition usually would, in fact, survive and be extremely effective among as few as five or six competitors, till they formed some sort of union with each other."[24] No well-formed theory of oligopoly governed his thinking, and thus he saved himself the ordeal, first, of assuming full joint profit maximization when there are few competitors, and then of finding later a complex of reasons for doubting whether in fact this outcome is likely under dynamic condi-

[21] *Essentials*, p. 201.

[22] *Ibid.*, pp. 380–82; italics in original.

[23] *Ibid.*, pp. 383, 395.

[24] *Ibid.*, pp. 201–02.

tions. With only moderate skepticism he might have accepted Schumpeter's view that the monopoly elements may be just sufficient to offset the forces of "creative destruction" which threaten the disappearance of profit. Clark observed:

> The actual shape of society at any one time is not the static model of that time; but it tends to conform to it, and in a very dynamic society is more nearly like it than it would be in one in which the forces of change are less active. With all the transforming influences to which American industrial society is subject, it today conforms more closely to a normal form than do the more conservative societies of Asia.[25]

Marshall, like Clark, fits poorly the supposed pattern of older thinking that we are questioning—a pattern of implied optimism respecting capitalism mistakenly resting on its assumed close resemblance to some model of near-perfect competition. Marshall was at least in part aware of the theoretical import of that ideal competitive state in which producers sell "in a large open market in such small quantities, that current prices will not be appreciably affected by anything which they may do or abstain from doing . . . ";[26] but he disliked pushing his hypotheses so far. For better or worse, a "principle of continuity," as he had called it, animated his thinking, and he saw "great mischief" in "drawing broad artificial lines of division where Nature has made none."[27] Thus, even in his *Principles*, in explaining "normal" pricing in manufacturing and merchandising, he did not adopt as his starting point the fluid, market-determined pricing of agriculture, but instead assumed the condition of quoted prices which prevails in such markets, with each seller dependent not on an impersonal body of purchasers but on specific patronage. For instance, in considering the common situation of firms that immediately must operate below capacity, he says:

> In a trade which uses very expensive plant, the prime cost of goods is but a small part of their total cost; and an order at much less than their normal price may leave a large surplus above their prime cost. But if producers accept such orders in their anxiety to prevent their plant from being idle, they glut the market and tend to prevent prices from reviving. In fact however they seldom pursue this policy constantly and without moderation. If they did, they might ruin many of those in the trade, themselves perhaps among the number; and in that case a revival of demand would raise violently the prices of the goods produced by the trade. Extreme variations of this kind are in the long run beneficial neither to producers nor to consumers; and general opinion is not altogether hostile to that code of trade morality

[25] *Ibid.*, p. 197.

[26] Alfred Marshall, *Industry and Trade* (London, 1927), p. 401. Much of this volume was written long before its appearance in 1919, part of the type having been set in 1904.

[27] *Principles*, preface to the 1st edition as appearing in the 8th, p. ix.

> which condemns the action of anyone who "spoils the market" by being too ready to accept a price that does little more than cover the prime cost of his goods, and allows but little on account of his general expenses.[28]

Thus, in his theory of short-run use of plant capacity, Marshall implicitly rejects pure competition as his expository framework, and he rejects also the allocative result of pure competition as a sufficient criterion in judging control through markets.

Marshall's *Principles* was devoted to what he called "foundations," the exposition of the "normal" in equilibrium terms; and the more "biological" approach required by the development of modern industry he put aside for separate analysis in his *Industry and Trade*.[29] In this analysis the prevailing theme is that even "open" markets display only a qualified competition, and monopoly and competition "shade into each other by imperceptible degrees." "Every manufacturer, or other business man, has a plant, an organization, and a business connection, which put him in a position of advantage for his special work"; and thus "for the time being he and other owners of factories of his class are in possession of a partial monopoly. . . . Combinations for regulating prices aim at consolidating provisionally this partial monopoly, and at putting it in good working order. . . . "[30] In this setting he examines at length the growth of plant size for technical reasons and the many-rooted development of corporate combination and cartelization in Germany, Britain, and America.

Competition has a central place in neoclassical theory; but Marshall, its great exponent, remained unexcited by his impressive evidence that competition is manifest mainly in rough approximate ways. Monopoly power is a continual threat, but "absolute monopolies," he believed, "are of little importance in modern business as compared with those which are 'conditional' or 'provisional' " and the latter keep their place only if "they do not put prices much above the levels necessary to cover their outlays with normal profits." Like Clark, Marshall thought a "severely monpolistic price policy" unlikely because "a man of sound judgment . . . will keep a watchful eye on sources of possible competition, direct and indirect." Potential competition, the competition of substitutes, a long-run concern over the welfare of customers, were all stressed as significant restraints.[31]

[28] *Ibid.*, p. 375.

[29] As explained in the preface to the 8th edition of the *Principles*, pp. xii–xiv.

[30] *Industry and Trade*, pp. 178, 196. Marshall's extensive pre-Chamberlin exposition of the theme of monopolistic competition is set forth by H. H. Liebhafsky in "A Curious Case of Neglect: Marshall's *Industry and Trade*," *Can. Jour. Econ. and Pol. Sci.*, Aug. 1955, XXI, 339–53.

[31] *Industry and Trade*, pp. 395–98, 405–09, 523–26.

Marshall saw also the restraining effect of product differentiation. Though it violates the purity of competition, it obstructs all arrangements for price control, which are difficult to bring about when products are not standardized. At the same time Marshall observed that standardized goods, which include "raw materials or half-finished products, or implements" used in business, are likely to be bought by firms that possess market power and "therefore are likely to meet the danger of oppressive action on the part of a combination, in control of things which they need to buy, by a counter-federation of their own. That is apt in its turn to stimulate the growth of similar federations on the part of traders or producers who need to buy some of their products; and so on till the end of the chain. . . . "[32] So "countervailing power," and the condition tending to produce it, received a respectful nod.

Nothing like the "classic model" seems to have been considered seriously by Marshall as a policy goal. Early industrial competition, back to Ricardo, had not resembled any sort of market ideal, though the contrary is now often assumed. It was rather the "aggressive competition" of "crude, though energetic men," a "species of warfare," and was not likely, as the preceding section indicated, to produce a "solid prosperity." For most of British industry Marshall found adequate the more restrained kind of competition, with the greater admixture of monopoly, which came in his day. Even in America, he thought, "Anglo-Saxon moderation and stability have enabled competitive and monopolistic abuses to be kept within relatively narrow limits, with but little direct intervention of authority." At the same time, monopoly was more dangerous than was generally realized, with greater menace in "monopolistic association" than in "monopolistic aggregations"; and a policy more positive than publicity, which he generally favored, might become necessary.[33]

With such spokesmen as Clark and Marshall writing in this vein, it is surprising that Schumpeter should have belittled neoclassical doctrine as he did. To him the competition of his predecessors was a "competition within a rigid pattern of invariant conditions," and not at all the competition of new and better products and processes that he thought important. He failed to note that this emphasis of his was essentially an unfolding of earlier thought and that he was quite in the earlier vein in saying of this latter competition that it "acts not only when in being but also when it is merely an ever-present threat . . . " and that "in many cases, though not in all, this will in the long-run enforce behavior very similar to the perfectly competitive pattern."[34] It is surprising, too,

[32] *Ibid.*, p. 549.

[33] *Ibid.*, pp. 179, 656, 400.

[34] Schumpeter, *op. cit.*, pp. 84–85.

that Schumpeter, in these allusions to traditional economics, failed to credit it with explaining the broad market and value structure that his theory implicitly relied on in circumscribing the distortions of crudely competitive markets. He saw the older economics not in its whole relevant expanse but only in its effort to sharpen particular relationships with the tools of static theory. In another context, however, that of his "socialist blueprint," he paid neoclassical economics the ultimate tribute of relying almost step by step on its essential structure in showing how socialism may solve the general problem of economy in using resources.[35]

IV. *Models and Policy*

There has been looseness at all times in perceiving the role of static models of competitive market operation. Such models are useful, indeed essential, in rendering manageable the numerous elements in the general problem of order in the economy. They supply the framework for tracing allocative effects of given practices and policies, and in this role provide a starting point in observing when market power is manifest. But static models may also mislead: through being supposed to reflect closely the actual processes of markets; through suggesting that they embrace all elements of welfare and afford a basis for judging economic performance as a whole; through tempting the user to toss all departures from their exact conditions into a common pot called monopoly and leading him, without guidance as to the seriousness of the deviations, into unhappy conclusions as to how the economy is working, or should be expected to work.

However, economists who seem at times to insist in supposed traditional fashion on near-perfect competition as a condition of acceptable economic performance may not carry this insistence into their more practical judgments. Galbraith supports his conception of earlier thinking by repeated use of Hayek's statement in *The Road to Serfdom* that "the price system will fulfill this function [of general control] only if competition prevails, that is, if the individual producer has to adapt himself to price changes and cannot control them." But the context of this statement does not imply purity of competition, since Hayek is only declaring the general superiority of control through markets over "central planning for the growth of our industrial system," which, he says, is by comparison "incredibly clumsy, primitive, and limited in scope." And he indicates that he finds acceptable a competition that can ordinarily be reconciled with the economies of size—one in which the firm, while it cannot control prices, can certainly influence them.[36]

[35] *Ibid.*, Ch. 16.

[36] F. A. Hayek, *The Road to Serfdom* (Chicago, 1944), Ch. 4. The first quotation is from p. 49 and is used by Galbraith, *op. cit.*, pp. 15, 35.

Pigou, with his elaborate concern over deviations from equality in marginal social net products, may likewise be thought of as intolerant of imperfect market adjustments. But Pigou was explicit that "simple competition," as he called it, is not feasible technically; and he preferred a limited antitrust approach, such as Clark favored, to a more drastic control of business.[37]

But even though they were not purists in their conception of adequate competition in a policy context, should not all these exponents of older thinking have been overwhelmed by the full impact of modern oligopoly theory? While granting some latitude to business decision in a dynamic system, could they digest the idea that business firms, separate but few in number, may so calculate each other's moves that they arrive at the price and output conclusions of the single monopolist? However loosely their frame of thought is construed, can modern markets be made to operate successfully within it?

The answer is yes, if we accept Clark and Marshall as spokesmen of earlier thinking and are not ourselves overwhelmed by the first approximations of modern theory. Indeed, without certain present insights, they came close to the spot where we now find ourselves, as conflicting insights begin to cancel out. Unworried by the neat logic of joint profit maximization when competitors are few, they were not bound to investigate the exacting and unusual conditions of that logic: its assumptions of a common view of demand and cost functions, of lack of aggressive desire for a larger share of markets, of standardization not only of products but of market terms in general, of pricing that is open and above-board, of absence of fear of new entries and substitute products and all the dynamic hurly-burly that Schumpeter made the center of his thinking. About the same position can be reached, in an unsophisticated way, without first falling into the oligopoly trap and then freeing one's self from it.

Thus the views mainly to be corrected are not those of the older economists. They had a fair sense of the impact of modern industry, and on tenable grounds held that markets might still exercise adequate control, while permitting desirable progress. Perfect competition must fail as a useful policy norm not merely because markets do not operate in that way but because we would not want them to. The views to be corrected now by theories of a "new competition" that is "workable," or even by theories of "countervailing power," are rather those of followers of Chamberlin who fell into the bad habit of equating competition with pure competition, of confusing theoretical benchmarks with

[37] A. C. Pigou, *The Economics of Welfare*, 4th ed. (London, 1950), Ch. 21. In this chapter Pigou notes the possible restraining effect of the countervailing power of opposed monopolies; but he doubts its effectiveness in protecting the public.

policy norms, of expecting highly monopolistic behavior in most markets where competitors are few.

Undoubtedly the study of markets has been revitalized in the last quarter-century. New theory has suggested what to look for, industry characteristics have been revealed with new significance, new insights into policy have been gained. But still, in the field of practical policy, these developments have worked little effective change; nor is it clear that they will. It has seemed useful , for instance, with competition and monopoly commingling over a wide range, to devise means of measuring the degree of monopoly in markets. Ingenious techniques have been contrived in the abstract, and there has been some attempt to apply them, especially in the case of concentration indexes. But one easily agrees with Machlup when, after reviewing these efforts, he concludes that such measurement is "even conceptually impossible," quite apart from its applicability.[38] Oligopoly theory seems less promising now than it once did, not only because of its profusion of elements but because factors other than numbers are seen to be widely significant.[39] It is almost shocking to recall the view of commentators after the *Tobacco* decision (1946) that this theory had therewith been made part of judicial standards and might properly dominate them in such cases.

The nature of policy problems forces us back toward the looser approach of earlier economists, and indeed of competent lawyers and judges. Even if we could measure degrees of deviation from pure competition, we would accomplish little unless pure competition were the market condition really desired—the condition that would promote a balanced achievement of diverse economic goals; and surely it is not. And even if we had a significant measurement, related to a truly optimum market norm, the policy question would remain: In a society in which ideal blueprints never materialize, what degree of departure from the norm is reasonably acceptable, in light of political as well as economic factors? More theory and more research will aid us; but there can be no answer except through the kind of experienced judgment always relied on in such matters.

Views differ greatly as to the desirable form and rigor of antitrust policy; but the differences do not really spring from a theoretical cleavage. They arise, as in the past, from dissimilar appraisals of incommensurable goals and market factors as seen in a framework that remains about the same. Economists who stress the nice equating of marginal results are more alarmed by monopoly elements than are

[38] Fritz Machlup, *The Political Economy of Monopoly* (Baltimore, 1952), Ch. 12, esp. pp. 526–28.

[39] See, for instance, Carl Kaysen in the National Bureau of Economic Research volume, *Business Concentration and Price Policy* (Princeton, 1955), p. 118.

economists who stress productivity and progress. The former have also a stricter idea of what reasonable profit means. Such groups may view differently the contribution of great firms in lowering costs and improving products, the competitive potency of product and technical substitutes, the need of market restraints to induce innovation and to prevent harmful price-cutting where reserve capacity accompanies growth. But these grounds for disagreement are as explicable in the theory of Clark and Marshall as of today.

To this point our theme has been developed without mention of John Maurice Clark, son of John Bates and leading formulator of the reasons why competition may be effective in an economy in which monopoly elements are common. In his well-known paper, "Toward a Concept of Workable Competition," Clark, it seems, was not trying to close a gap caused by failure of the older theory, but was concerned rather with recent refinements of the competitive model which, he said, "may serve as a starting point of analysis" but which, when used as a guide in approaching policy have "seemed at times to lead to undesirable results. . . . "[40] In a sense he bridged the periods by paralleling the exacting modern idea of pure competition with an equally sophisticated conception of the realizable and acceptable working of markets, and thus formulated with added fullness and precision a basis of policy toward which his father and his father's contemporaries were moving.

Elsewhere J. M. Clark has said, in writing of his father: "What may reasonably be asked of the theorists of the current generation is that they integrate their findings with those elements of the thought of the preceding generation which have enduring value, and which they tend to neglect."[41] The present theory of pure competition and of departures from it grows naturally out of the older static analysis of markets; present theories of workable competition, even when stretched to make room for elements of countervailing power, likewise particularize older thinking regarding feasible market operation under dynamic conditions. Analysis of this side of modern capitalism requires no revolution in economic thought.

[40] *Am. Econ. Rev.*, June 1940, XXX, 241; reprinted in *Readings in the Social Control of Industry* (Philadelphia, 1942), p. 453.

[41] "John Bates Clark," in H. W. Spiegel, ed., *The Development of Economic Thought* (New York, 1952), p. 612.

INTEREST RATES AND MANUFACTURERS' FIXED INVESTMENT

By FRANZ GEHRELS AND SUZANNE WIGGINS*

The postwar revival of monetary policy as an economic regulator in Britain and America has been accompanied by lively discussion and some new contributions to monetary theory. Important among them is the credit-rationing doctrine. Briefly, this is the doctrine that central bank operations on the money market affect investment, not mainly through the cost of credit, but through its availability. When the central bank pushes up the yields of short-term government securities, banks and nonbank lenders will increase the share of short-term governments in their portfolios at the expense of other earning assets. This action reduces reserves for the banking system as a whole and causes further restriction of loans to business borrowers. Conversely, when the central bank pushes down money-market rates, the decreased attractiveness of short-term yields, and the increase of reserves, will lead to increased availability of loan funds at relatively unchanging cost. In addition, it is sometimes argued that banks and nonbank lenders consider probable future movements of intermediate- and long-term security prices. The fear of capital losses induced by a rising pattern of interest rates may cause prospective bond purchasers to hold off until they expect no further rise of rates. At the same time, potential borrowers who expect to need additional credit in the future may become fearful of not getting suitable accommodation at a future date, and in consequence restrict their present borrowing and expenditure commitments.[1]

The foregoing argument implies that, under the credit-rationing hypothesis as under the classical interest-cost doctrine, there should be an observable negative relation between interest variations and investment. Only the *mechanism* relating interest and investment will be a different one under credit rationing from that under the older doctrine. Since security yields of different maturities usually move sympathetically, a variety of rates ought to show a significant relation to invest-

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[1] An extensive and provocative discussion of the credit-rationing doctrine is contained in two full issues of the *Bull. Oxford Inst. Stat.*, Apr. and May, and Aug. 1952 Vol. XIV.

ment. A number of them should be satisfactory barometers of the ease or difficulty of obtaining loans, which in turn affects the rate of investment.

However, empirical findings have usually been discouraging both for the classical and the modern view. Business executives, in answering questionnaires, have given low importance to the cost of borrowing and to the availability of outside funds.[2] Regression studies on investment either did not take the interest rate into account, or found that it had importance only for special types of investment, notably in railroads, utilities, and residential construction. Liquidity variables appeared unimportant in both types of studies.[3]

Here we shall present evidence that with the proper combination of explanatory variables, the appropriate time lags, and sufficiently short periods, an interest-investment relationship is present in the manufacturing sector as well. While the present writers are partial to the credit-rationing version of the interest-investment relation, the evidence presented below does not tend to refute the classical view. Rather, the evidence appears consistent with both descriptions of the regulating mechanism. However, the advocates of active monetary policy may derive only limited comfort from the evidence. For the time lags which seem to give the highest significance for interest rates are great enough to imply a difficult timing problem for monetary measures.

Section I gives some results of multiple-regression computations for fixed investment in the postwar period. Section II discusses the explanatory variables used. Section III gives estimates of the parameters in the structural demand equation derived from a two-equation model using the same data. Section IV summarizes some results on postwar manufacturers' inventories. Section V compares postwar monetary events with our time-lag hypothesis; and Section VI gives some findings on prewar fixed investment which agree in some respects with those for the postwar period in Section I.

I. *A Multiple Regression Computation: Postwar Fixed Investment*

Our examination of manufacturers' investment deals primarily with the period from the middle of 1948 to the middle of 1955. Taking this

[2] See W. Heller, "The Anatomy of Investment Decisions," *Harvard Bus. Rev.*, Mar. 1951, XXIX, 95–103; I. Friend and J. Bronfenbrenner, "Business Investment Programs and Their Realization," *Surv. Curr. Bus.*, Dec. 1950, XXX, 11–22; R. Eisner, *Determinants of Capital Expenditure*, University of Illinois Bull. (Urbana, 1956).

[3] See, in particular, J. Tinbergen, *Statistical Testing of Business Cycle Theories*, Vols. I and II (Geneva, 1939); L. Klein, *Economic Fluctuations in the United States*, 1921–1941 (New York, 1950); J. Meyer and E. Kuh, "Acceleration and Related Theories of Investment: An Empirical Inquiry," *Rev. Econ. Stat.*, Aug. 1955, XXXVII, 217–30; L. R. Klein and A. S. Goldberger, *An Econometric Model of the United States, 1919–1952* (Amsterdam, 1955); C. F. Christ, "Aggregate Econometric Models," *Am. Econ. Rev.*, June 1956, XLVI, 385–408.

period has a number of advantages: It leaves out the immediate postwar time of shortages, when the rate of investment depended mainly on the supply of equipment and materials. It has two periods of mild recession—1949 and 1953–54—followed by recoveries. Monetary policy was reflected in fluctuating interest rates, especially after 1950. Data are available from the Securities and Exchange Commission on manufacturers' liquidity from the second half of 1947.

We have concentrated on plant and equipment investment because this accounts for almost one-fourth of total capital formation in most years; the factors going into investment decisions for the entire sector are homogeneous; and it is an area where the interest rate has hitherto not been credited with much importance by empirical studies.

Of the numerous regression equations fitted by least squares, the two following gave the highest multiple correlations:

$$I_t = 1{,}812.6 + \underset{(.1181)}{.1326\pi_{t-2}} + \underset{(6{,}923)}{7{,}367P_{t-2}} - \underset{(74{,}230)}{130{,}540R_{t-2}} - \underset{(2193)}{3389Q_t} \tag{1}$$

$$r = .9203$$

$$I_t = -3658.7 + \underset{(.1755)}{.1759\pi_{t-2}} + \underset{(11{,}260)}{9{,}218P_{t-2}} - \underset{(61{,}380)}{55{,}140R_{t-2}} - \underset{(2{,}843)}{3{,}204Q_t} \tag{2}$$

$$r = .8640$$

I is plant and equipment outlay by manufacturing firms in real terms.

π is profits, deflated by wholesale prices excluding farm products and food.

P is the price index for capital goods, also deflated by wholesale prices.

R is the rate of interest—the industrial bond yield in equation (1), and the three-month treasury-bill yield in equation (2).

Q is the "quick ratio," the ratio of cash plus government securities to current liabilities for manufacturing firms only.

r is the multiple-correlation coefficient adjusted for degrees of freedom.

The periods are semi-annual. Aside from increasing the number of observations, taking six-month periods increases the homogeneity of the periods with respect to credit conditions. Three important turning points in monetary conditions occurred at midyear—in 1947, 1949, and again in 1953. Taking calendar years would have obscured these changes by lumping together half-years which are dissimilar, monetarily speaking. Some problem of seasonality may result; however, we did not regard this as serious enough to call for a correction.

The subscript t refers to the particular 6-month period. π_{t-2} is profits

in the six-months *ending* a year earlier, while R_{t-2} is the interest rate at the beginning of the period a year earlier; and Q_t is the quick ratio at the beginning of period t. Time lags of zero, six months, and one year were tried in a variety of combinations before equations (1) and (2) were arrived at. The 95 per cent confidence intervals are given in parentheses under the regression coefficients.[4]

With periods only six months in length the possibility arises of the deviation of investment from its predicted value depending on its deviation in the previous period. This would mean that the assumption of independence of the disturbances, made for least-squares computations, does not hold. We tested for serial correlation of the disturbances in equation (1) by taking the ratio of the mean-square successive differences to the variance, and found this to have a value of 3.08. From B. I. Hart's table of random probabilities for this ratio, we found that there is little ground for rejecting the hypothesis of no serial correlation, as the ratio is well beyond the 1 per cent significance level.[5]

The theoretical basis for lags of such length is that firms plan their major outlays for plant and equipment well in advance. It takes time to draft engineering plans, to negotiate with suppliers, to arrange financing, and to obtain agreement among those in the firm sharing responsibility for the decision. In large firms having more complex organizations the lapse of time is probably greater than in small-and medium-sized companies, and the lag is greater for large projects than small ones. Friend and Bronfenbrenner, on the basis of their questionnaire-survey, came to the conclusion that "aggregate expenditures for plant and equipment can be estimated one year ahead with reasonable accuracy on the basis of the amounts which businessmen anticipate spending."[6]

The variables relevant for decisions made a year, more or less, in advance would also be those prevailing around the time of decision rather than at the time the project is carried out. Thus the conditions under which funds are available, the prices of investment goods, and the level of profits prevailing around the time of the decision would seem more significant than those at the time of the investment itself. However, a subsequent sharp change in any of these variables may cause firms to modify their plans before they are carried out; if the period had been characterized by violent changes, our equations (1) and (2), with their long lags, might have given a much poorer fit.

[4] The two-tail t-test was applied to the liquidity and price coefficients; the one-tail test was applied to profits and interest, as their signs were assumed to be known a priori.

[5] See B. I. Hart, "Table of Probabilities for the Ratio of the Mean Square Successive Difference to the Variance," *Annals Math. Stat.*, 1942, XIII, 213.

[6] Friend and Bronfenbrenner, *op. cit.*, p. 11.

Figure 1 (for which Table I provides the data) compares the actual level of investment (solid line) with the levels predicted by equation (1) (broken line) and by equation (2) (dotted line). It shows that both equations successfully predicted the direction of all the substantial changes in investment, with the exception of the moderate downturn from the second half of 1951 to the first half of 1952. This failure may have been due to the abnormal situation created by the Korean boom and its aftermath. The rapid price-level rise had ceased, and inventory

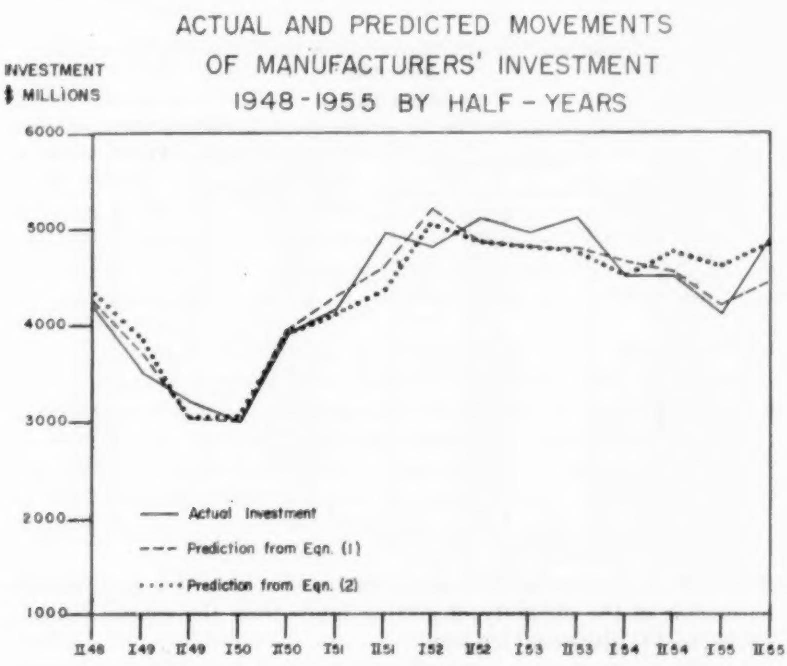

FIGURE 1

growth had diminished sharply, thus creating uncertainty and causing downward revision of investment plans. On the other hand, the drop of investment in 1949, and again in 1954, was correctly predicted; and the rapid increase of 1950–51 was successfully registered. Finally, both equations predicted the increase of investment for the second half of 1955; although understating the magnitude of the increase. Data for this period were not available when the equations were computed, and thus were not included in the time series.

II. *The Predicting Variables*

A. *The different rates of interest.* The industrial bond rate gives a substantially better fit than the treasury-bill rate probably for two reasons. It reflects conditions on a market to which the industrial borrower resorts directly, whereas the bill market is only an indirect indicator of the conditions facing him. In addition, the yield on industrial bonds is not a pure rate; it contains a variable risk premium which reflects changing business expectations of both borrowers and lenders. The significance of the bond rate is probably only in limited degree due to its effect on the cost of borrowing; rather it serves as a good general barometer of the difficulty of getting funds from the capital market, banks, and institutional lenders.

Table I.—Actual and Predicted Movements of Manufacturers' Investment 1948–1955

(in $ millions)

Period	Actual Investment	Prediction from Equation (1)	Prediction from Equation (2)
1948, II	4,216	4,270	4,373
1949, I	3,488	3,701	3,839
1949, II	3,220	3,061	3,042
1950, I	2,982	3,010	3,061
1950, II	3,893	3,974	3,890
1951, I	4,146	4,282	4,096
1951, II	4,968	4,595	4,371
1952, I	4,779	5,219	5,054
1952, II	5,096	4,829	4,843
1953, I	4,940	4,804	4,799
1953, II	5,110	4,790	4,756
1954, I	4,480	4,648	4,485
1954, II	4,500	4,572	4,738
1955, I	4,116	4,186	4,577
1955, II	4,903	4,474	4,863

In addition to the two rates above, we tested the yield on long-term government bonds. The regression equation gave a fairly good fit, but the explanatory variables had much weaker statistical significance than in the other two cases. This may indicate that, under present institutional arrangements, the short-term rate is a better indicator of credit conditions than the purest of the long-term rates. However, if the Federal Reserve were to operate in the bond market with the same objectives as it does today in the money market, bond yields might well become the better indicator.

It is of interest that the coefficient of the treasury-bill rate, though not significantly less than zero at the 5 per cent level, is significant at

the 10 per cent level. Central bank action to influence economic activity traditionally operates through short-term rates, which then exert a pull on the other markets for funds. However, it is at least a little disturbing that the effect of interest-rate changes on investment should have such a long time lag. The bill rate showed no significance with shorter lags. If changes in monetary policy have their main effect on an important segment of aggregate investment only a year hence, and much less effect on current capital formation, a difficult timing problem exists. Action is usually not taken until symptoms of recession or inflation actually appear; by the time the action has its main effect, conditions may have changed, and the measures taken may no longer be appropriate. Thus monetary tools appear subject to many of the same difficulties as the Keynesian fiscal tools; and the difficulties in the case of monetary policy may be more intractable, since they are due to the nature of investment decisions, rather than to outmoded administrative procedures.[7]

B. *Profits.* Profits make a good showing as an explanatory variable, whether taken for the six months immediately preceding the investment, one period earlier than this, or two periods. This is not surprising, as profits have a strong autoregressive tendency. However, it is of interest that profits for the six months ending *a year before* appear to serve so well for prediction.

It was difficult to decide on the deflator appropriate to obtain "real" profits. One might argue for deflation by the price index of investment goods, since it is real expenditure for investment that is being measured. It turned out that the multiple correlation coefficient was almost equally good whether one deflated profits by prices of investment goods or by wholesale prices. But the regression coefficients for profits and interest had better confidence intervals in the latter case.

C. *Prices of investment goods.* The price coefficient has the "wrong" sign in both regression equations above. Price has an influence on the rate of investment and in turn is influenced by investment; here the latter relation appears to be strong enough to make the coefficient positive. At the same time, the fact that lags of less than a year gave no significant relation implies that prices respond to the placing of orders, which may occur a year or more in advance of the investment, rather than to the investment itself.

While we have not found a correct demand equation for investment, the one-year lead of investment-goods prices over investment may

[7] The following comment, based on interview results, is found in Eisner, *op. cit.*, p. 34: "One lag to which the interviews called the writer's attention is that from the borrowing of money to its utilization in capital expenditures. This lag may apparently be fairly long. To the extent that it is, efforts to control the rate of investment by manipulating the money market and/or the rate of interest involve a serious complication, . . . "

make them a good predictor. For they reflect the volume of orders placed in advance of the investment.

D. *Liquidity*. The attempt to find any effect of liquidity on investment was unsuccessful. This was true for all time lags; and it appeared to make no difference whether the quick ratio was taken or the difference between current assets and total liabilities.

The approach used was probably not appropriate for testing the liquidity hypothesis; aggregate changes over time in liquidity of firms reflect changes in profits, dividend policy, taxes and rebates, attitude toward expansion, access to outside financing. It is probably only in special situations, such as the early postwar period, that one can find a positive relation between liquidity and investment.[8] At that time the business sector had acquired liquid funds involuntarily, and now the accumulated demand was released. The more liquid a firm, the better able it was to carry out expansion. However, even in this case one may surmise that sufficiently elastic bank credit might equally well have supported the whole of the investment boom that took place from 1945 to 1948.

It appears that, in the aggregate, liquidity changes are as much a consequence of investment decisions as they are a cause, because the amount of liquid holdings of firms is a residual. However, the SEC sample is dominated by the larger firms, and it may be that liquidity is more important for small firms, who have less easy access to outside funds.[9] When the large firms accumulate liquid assets, this may reflect pessimism about sales prospects and consequently a low rate of investment; when small firms accumulate funds, this may reflect plans to finance expansion out of internal funds.

The fact that liquidity with a negative sign shows significance when taken at the beginning of the period, but none when taken either six months or a year earlier, implies that the liquidity changes might be taken as a barometer of investment. If the other three variables have predicted, say, a rise of investment, a drop of liquidity would confirm that the investment plans are being carried out. A rise of liquidity in this situation might indicate that something had gone awry and had led to a change of plans.

However, liquidity *alone* as an indicator of investment for the immediately following period is not very reliable. For the first half of the

[8] See the comparison between postwar agricultural and industrial experiences made by R. N. McKean, in "Wartime Monetary Events and Monetary Theory," *Am. Econ. Rev.*, Proceedings, May 1952, XLII, p. 124–33.

[9] Internal availability of funds was important to the firms interviewed in Minnesota, and reported by Heller. Even when outside funds were available, the successful firms preferred delaying expansion to permitting outsiders to take part in the firm's decisions. See "Anatomy of Investment Decisions," *op. cit.*, p. 101–02.

period, to the end of 1951, liquidity performs rather well, only once moving in the same direction as investment. But for the second half, 1952 to 1955, it moved in the same direction four times in seven.

A fairly good, although poorer, fit is also obtained when liquidity is omitted from equation (1), and only profits, the industrial bond rate, and investment prices are taken. In this case the correlation coefficient is .8217, and the explanatory variables all appear highly significant. However, the lower correlation indicates that liquidity improves substantially the predictive value of the equation.

III. *An Estimate of a Structural Demand Equation*

While the foregoing regression equations both appear satisfactory for predicting investment, they are not satisfactory *demand* equations. For the price index of investment goods has been treated as an independent variable, although there is reason to believe that the prices of investment goods and the level of investment interact on each other. In addition, liquidity is probably dependent partly on investment, on profits, and perhaps on the rate of interest. However, in order to concentrate on the effect of interest variations, and in order to retain a simple model, we shall continue to treat liquidity as independent.

The interaction of investment and the prices of investment goods is taken into account by introducing an equation for the supply of investment goods:

$$I_t^s = a_0 + a_1 P_{t-2} + a_2 W_{t-2} \quad (a_1 > 0,\ a_2 < 0)$$

The supply of investment goods is assumed to be an increasing function of price and a decreasing function of the average hourly wage rate (W) in investment-goods industries, deflated by the wholesale price index. This gives us two equations in the two endogenous variables, investment and the price index of investment goods. By simple algebra we eliminate the price variable to give an equation for investment in terms of the exogenous variables only; then we eliminate investment to obtain an equation for price alone in terms of the same set of exogenous variables.

The two reduced-form equations are:

$$\begin{aligned} I_t = 6{,}570 &+ \underset{(.1276)}{.1092\pi_{t-2}} - \underset{(115{,}800)}{176{,}000R_{t-2}} - \underset{(2{,}490)}{3{,}647Q_t} + \underset{(3{,}880)}{2{,}972W_{t-2}} \qquad (3)\\ r &= .9007 \end{aligned}$$

$$\begin{aligned} P_{t-2} = .6057 &- \underset{(.000007855)}{.000002514\pi_{t-2}} - \underset{(7.124)}{7.044R_{t-2}} + \underset{(.1241)}{.0210Q_t} + \underset{(.1934)}{.4347W_{t-2}} \qquad (4)\\ r &= .9222 \end{aligned}$$

The structural demand equation is then:

$$(5) \quad I_t^D = 2{,}430 + .1256\pi_{t-2} - 127{,}890R_{t-2} - 3{,}791Q_t - 6{,}837P_{t-2}$$

The price coefficient now has the "correct" sign, for investment is a decreasing function of the price of investment goods. The price elasticity of demand is then computed to be -1.5970, that is, not much greater than unity. This finding is consistent with the widely held belief that demand for capital goods is not highly elastic.[10] However, as the price-slope coefficient is the ratio of the two wage coefficients, its reliability is rather less than that of either of these coefficients.

The process of getting back from the observed parameters in equations (3) and (4) to the structural parameters of equation (5) is comparatively easy providing that just one coefficient relating investment to an exogenous variable in (5) is zero. This condition is just met here because wages in the investment-goods industries are not included among the variables in (5), and the wage coefficient is therefore zero. We then solve first for the price coefficient, which is (with opposite sign) the ratio of the wage coefficient in (3) to that in (4). Each of the other coefficients is then found by adding to the corresponding one in (3) the product of the coefficient in (4) by the parameter already found for the price.

More formally, we can say that investment and the price variable are related to the exogenous variables in two independent ways, the observed relations of (3) and (4) and the structural relations of (5). We, in effect, eliminate investment and price by equating the right-hand sides of (3) and (4) combined, with the right-hand side of (5). This gives an aggregative equation in only the exogenous variables, which holds term-by-term as well as in the aggregate. When we take the separate equations, each in one term, we can solve for the structural parameters by factoring out the common term. One of these equations will be in a single unknown, and so we can use the solution of this equation to solve the others.

IV. *Postwar Manufacturers' Inventories*

It has sometimes been maintained that interest-rate variations have a stronger and quicker impact on inventory levels than on the rate of fixed investment.[11] In an attempt to find statistical support for this view, we have followed a procedure similar to that above for fixed investment.

[10] Eisner's interview results indicated that construction costs were "not a significant factor in determining the physical volume of investments." This finding, may, however, be due to the buoyant state of demand existing in 1951 and 1952, the time of interviews. At that time the business executives questioned believed that they could easily raise their product selling prices. See Eisner, *op. cit.*, p. 26.

[11] See, for example, R. G. Hawtrey, *Capital and Employment*, 2nd ed. (London, 1952), pp. 45–54.

Profits, interest, and the quick ratio were taken as the determining variables, with the level of inventories as dependent. On the assumption that profits vary rather closely with the price level, we have omitted price as an explicit variable.

Profits when taken for the six months immediately preceding had a negative coefficient, perhaps indicating that inventories over short periods act as a buffer to unanticipated sales variations. When taken for the period ending six months earlier profits had a positive coefficient, perhaps indicating that inventories are adjusted positively with profits and sales expectations, when enough time is allowed for the adjustment.

The market yield on treasury bills had a positive coefficient whether taken instantaneously or six months earlier. Thus there was no evidence of interest influencing the level of stocks.

As in the case of fixed investment, the quick ratio had a negative coefficient for both time lags, but had the higher significance when taken with a zero time lag. As with fixed investment the explanation is probably that liquidity *reflects* changes in holding of stocks, rather than being an important cause of such changes.

V. *Comparison with Postwar Monetary Events*

While there is nothing conclusive about such an examination, a cursory review of postwar monetary events may show whether there are obvious contradictions between our time-lag hypothesis and the events. The large dips in investment occurred in early 1949 and early 1954; the big upswings were in the middle of 1950 and the fall of 1955. On the other hand, significant credit restraints were effective in the middle of 1947, the middle of 1949, late in 1952, and early in 1953. Measures to ease credit were undertaken in mid-1949 and the fall of that year, and in the summer and fall of 1953.

The sharpest tightening of credit in the postwar, pre-Korea period came in the summer and early fall of 1947. Up to the summer treasury bills, certificates, and bonds had been pegged. When the pegs were removed, the bill rate jumped immediately from 3/8 per cent to nearly 1 per cent, and the other rates moved up more gradually until December, when they leveled off. The year 1948 saw only slight further increases. If there had been an immediate impact on investment one would have expected to see it in the fall of 1947 rather than at the end of 1948. However, this episode does not contradict our hypothesis of the one-year lag.

Efforts to ease credit conditions did not occur until 1949 when the recession was already under way. After a reduction of reserve requirements in the spring, the Open-Market Committee announced in June that henceforth its operations would have "primary regard to the gen-

eral business and credit situation."[12] However, their actions appear not to have been very aggressive; for although industrial bond yields declined substantially, treasury-bill rates fluctuated little. Again, there is no evidence of any effect of these changes on investment until almost a year later, in the late spring of 1950.

In the boom that followed the outbreak of Korean hostilities successive measures of monetary restraint, at first hampered by Treasury refunding, led to a slow but continued rise of security yields. Nevertheless, manufacturers' fixed investment rose to the end of 1951 and then maintained itself at a high level; activity generally behaved in a similar fashion. Once more, the time lag between monetary changes and the investment response, if any, appeared considerable.

A fourth episode is that from 1953 to 1955. Security yields were pushed up during the first half of 1953; then the authorities reversed themselves in June, driving yields down again sharply and holding them low until 1955. Manufacturers' investment remained above the previous year's level during the fall of 1953; but industrial output declined, owing probably to involuntary accumulation of inventories, in turn caused by lagging consumer demand.[13] Investment fell in 1954 and dropped further in the first half of 1955, thus lagging behind production both in the decline and in the recovery. Again, whatever effect tightening and then relaxing credit in 1953 had on investment, the impact seems to have been felt in the two succeeding years.

VI. *Prewar Investment*

A statistical analysis of manufacturers' fixed investment in the period 1933 to 1940 yielded results in some respects similar to and in others notably different from those obtained for the 1948–55 period. The one-year time lags as used in the previous case gave a fairly satisfactory fit when the industrial bond rate was used, but a much poorer one when the treasury bill rate was taken. However, in both cases the interest rate appeared to be significant and had the proper negative sign. Profits and prices of investment goods both appeared significant when the bond rate was used; but, in contrast to the postwar observations, both carried a negative sign. Because of the difficulty of obtaining appropriate liquidity data, we omitted any liquidity variable. The regression equation employing the bond rate is as follows:

$$\begin{aligned} I_t = 6{,}490 - {} & \underset{(323.5)}{438.5\pi_{t-2}} - \underset{(21{,}010)}{49{,}520R_{t-2}} - \underset{(3{,}715)}{2{,}964P_{t-2}} \\ & r = .7566 \end{aligned} \tag{6}$$

[12] See the *Fed. Res. Bull.*, Dec. 1949, XXXV, 1435.

[13] See the *Fed. Res. Bull.*, Feb. 1954, XL, 126.

In contrast to the postwar period, the best fit was not obtained from the use of one-year lags. When the determining variables were dated at the beginning of the period, profits took a positive sign, price became quite insignificant and interest retained the negative sign but with a lower significance. With six-month lags, profits had a negative sign but low significance, while interest and price both had negative signs and appeared highly significant. Both of these choices of lags gave multiple correlation coefficients of about .83.

These differences from the postwar period may be due to structural differences affecting inducements to invest between a period of prolonged depression and one of general prosperity. During most of the 1930's substantial excess capacity existed; an increase of sales, reflected in profits, would therefore not be a strong inducement to create additional capacity. On the other hand, there was probably strong pressure for cost-reducing investment, particularly in low-profit years. Such a thesis would explain the negative regression of investment on profits, and also the apparently greater strength of investment-goods prices as a determinant of investment.

The reason that profits moved from negative to positive in sign, as the profit variable was moved closer to investment in time, may be that profits became a *reflection* of investment through the multiplier, rather than a determining variable.[14]

Finally, the poor fit obtained when the treasury bill rate was employed may be due to the predominantly cheap-money policy after 1933. Bill rates showed little absolute variation around their very low yield and thus were not a satisfactory variable for statistical purposes.

VII. *Summary*

1. In order of statistical significance, variations in yields on industrial bonds, on treasury bills, and on government bonds appear to have an effect on manufacturers' fixed investment, but only with a one-year lag. The explanation offered for the relationship is that considerable time elapses between initial planning and carrying-out of investment, and that interest rates serve as indices of credit availability.

2. The prices of capital goods appear to affect the rate of fixed investment, but the coefficient of price elasticity found was not very much greater than one.

3. We were unsuccessful in finding the expected causal connection between liquidity and investment outlay; but this result was probably due to incorrect specification of the model for this purpose.

[14] More exactly, as profits have a fairly high degree of autoregression, those in period $t-1$ would move with those in period t. The latter would be a function of the rate of aggregate investment in period t, which has determined the level of national income through the multiplier.

4. Inventories showed a relation to profits and liquidity, but not to the rate of interest.

5. Prewar fixed investment did not show as sharply defined a lagged response to the exogenous variables as did postwar capital outlay: both one-year lags and shorter lags gave satisfactory fits, with the profits coefficient changing sign according to the lag. This suggests that our simple model may have good predictive value for a period of general prosperity and moderate fluctuations, but that it may have less value for a period of depression and great uncertainty.

Notes on Data and Sources

A. *Postwar fixed investment.* (1) Investment data were taken from the *Survey of Current Business*, "New Plant and Equipment Expenditures, Manufacturing." They were expressed in millions and deflated by the average price index during the period for machinery and motive products, also from the *Survey*. (2) Corporate profits were taken from the Securities and Exchange Commission *Quarterly Financial Report for Manufacturing Corporations*. They were deflated by the wholesale price index for the period following for "commodities other than farm products and food," from the *Survey*, and expressed in millions. (3) The quick-ratio data are also from the SEC *Quarterly Reports*. (4) The price of investment goods is the same index as in (1) above, but deflated by the wholesale price index used in (2), above, so as to give *relative* price. (5) The interest data are from the *Federal Reserve Bulletin*. (6) Average hourly earnings in durable-goods-industries are from the *Survey*.

B. *Postwar inventories.* Inventory data, seasonally adjusted, are from the *Survey*. They are at lower of cost or current market price; we have deflated them by the same wholesale price index as above.

C. *Prewar fixed investment.* (1) Profits, *Survey*, Supplements, 1936, 1938, 1952. (2) Interest rates, Board of Governors, *Banking and Monetary Statistics*, 1943. (3) Price of investment, wholesale price index of metals and metal products, from the *Survey*, and deflated by wholesale prices. (4) Investment in plant and equipment from "Capital Expenditure for Manufacturing Plant and Equipment," *Survey*, March, 1951, deflated, as above, by wholesale prices.

GROWTH IN CAPACITY AND CANADA'S BALANCE OF PAYMENTS

By JAMES C. INGRAM*

The purpose of this paper is to point out the way in which changes in productive capacity may have affected the Canadian balance of payments during the period 1900 to 1913. It is not to be claimed that change in capacity was the sole or even the predominant factor in the adjustment process, but that it was a powerful force which has been largely omitted from the principal studies of the period.[1] When it is used to supplement these earlier studies, the explanation of Canadian experience becomes neater and more complete. Some facts, hitherto unsatisfactorily explained, are accounted for. The modification suggested here for a particular case also has implications for the theory of transfers whenever net capital formation is involved.

In his classic study of the Canadian episode, Viner tested the traditional theory of adjustment derived from Thornton and Mill.[2] On the whole he found this theory, or its implications, to be consistent with the facts, with some qualifications for institutional peculiarities. This theory is too familiar to require restatement here, and we shall give only the barest outline of it.

An initial equilibrium is disturbed by an increase in loans to Canada from foreign sources. Under the gold standard the increased supply of foreign exchange drives the exchange rate to the gold-import point; the inflow of gold causes the Canadian money supply to rise; and consequent price changes cause imports to rise, exports to fall.[3] In this way the trade balance is turned against Canada, thus enabling the real transfer of capital to occur. Viner found that movements of reserves held in New York largely replaced gold flows in the Canadian case. Aside from this,

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[1] G. M. Meier, "Economic Development and the Transfer Mechanism," *Can. Jour. Econ. Pol. Sci.*, Feb. 1953, XIX, 1-19, explicitly connects Canadian expansion and the balance-of-payments adjustment. The reader is referred to this article for a carefully documented record of economic growth in the period.

[2] Jacob Viner, *Canada's Balance of International Indebtedness, 1900-1913* (Cambridge, Mass., 1924). See esp. Ch. 7, 9.

[3] Throughout this paper we shall use the terms "exports" and "imports" to refer to the total credits and debits on current account except for interest and dividends.

in all major respects he considered the observed events to be a confirmation of the theory.[4]

Later writers added an "income effect" to this analysis.[5] The inflow of funds causes money income and expenditure to rise in Canada and, as income rises, imports rise still further and exports fall. This addition helped to explain the speed with which the adjustment process worked and the relatively small gold flows required to accomplish the real transfer.[6]

There is, however, one significant flaw in this analysis, at least for the Canadian experience from 1900 to 1913. Both the classical and the modern parts of the theory of adjustment yield a prediction that exports will decline, but the indubitable fact is that Canadian exports rose steadily from 1900 to 1913. The rise in imports exceeded the rise in exports and thus enabled the real transfer to take place, but a modification of the theory is required to enable it satisfactorily to account for this sequence of events.[7]

The traditional theory of transfers makes no real distinction between a reparations payment and a capital movement. This is true for both the income approach and the price-specie-flow analysis. An inflow of funds is expected to set in motion changes in prices and incomes through which a real transfer is effected, but the productive resources of the receiving nation are tacitly assumed to remain unchanged during the adjustment process.[8] In some cases this procedure may be justified, but where the inflowing funds form part of an economic process in which the productive resources are fundamentally changing, the theory is inevitably incomplete. Indeed, it may be that the inflow of funds is itself induced by such changes in the economy, and thus the structural changes become an integral part of the transfer mechanism. If the theory of transfers dealt only with the very short run, the omission might be justifiable. But where, as in the case under examination, the transfer process though a number of years is being studied, the omission is a serious defect in the analysis.

[4] This does scant justice to the careful and thorough analysis that won Viner's study an important place in the literature of international economics.

[5] See, *e.g.*, L. A. Metzler, "The Theory of International Trade," in H. S Ellis, ed., *Survey of Contemporary Economics* (Philadelphia, 1948), Vol. I, pp. 211-22.

[6] These matters puzzled Taussig, as he suggested in a famous passage. *International Trade* (New York, 1928), p. 239.

[7] This does not imply that a theory must be realistic in all details. But it should yield accurate implications for the essential aspects of reality. The contention is that the behavior of exports is one of the essential aspects of the theory being examined.

[8] The income approach permits changes in utilization, and both approaches take into account shifts in resources; but neither considers change in total resources.

I. *Economic Growth and the Balance of Payments: A Simple Model*

Viner advanced the hypothesis that the disturbing factor in the period 1900–1913 was an increase in the flow of funds into Canada, and the problem he wished to examine was the response in the Canadian economy to this initial disturbance.[9] An alternative hypothesis, equally if not more plausible, is that the rapid expansion of the Canadian economy after 1900 created investment opportunities and attracted an inflow of funds. Of course it is true that if the foreign funds had not been forthcoming the Canadian boom would have been halted, and thus the two forces are inextricably linked together over the whole period. Still it may be argued that domestic expansion in Canada was the initial disturbance.[10]

Fortunately we do not have to settle this question of priority. Under either hypothesis, we can argue that the expansion of productive capacity during the period enabled supply to expand, enhanced Canada's ability to export, reduced the pressure to import, and thus influenced the adjustment in the balance of trade. That the trade balance nevertheless turned against Canada simply indicates a rate of expansion so rapid that the demand effects exceeded the supply effects of that expansion, thus necessitating a continued (and rising) inflow of capital if the rate were to be sustained. Domestic expansion and capital inflow may be regarded as coordinate, and we need not choose one causal sequence or the other.

The writer has tried to show elsewhere that there exists a rate of increase in domestic investment which a nation can maintain with no inflow of capital or loss of exchange reserves.[11] If the nation exceeds this rate it must import capital or lose exchange reserves.[12] The essential idea is a simple one, and represents an application of the Harrod-Domar[13] theory of equilibrium growth to the balance of payments.

Let us assume that resources are fully employed at every point in time during the period to be studied. If population (and the labor force) is growing, if net capital formation is taking place, and if previously

[9] Viner, *op. cit.*, pp. 16, 145.

[10] Meier, *op. cit.*, takes this view. He points out that expansion began in earnest in 1895, though no capital inflow appeared until 1905. In the three decades prior to 1895 Canada imported capital, however.

[11] "Capital Imports and the Balance of Payments," *So. Econ. Jour.*, Apr. 1956, XXII, 411–25.

[12] We assume fixed exchange rates and thus rule out the third possibility, a fall in the value of its currency.

[13] R. F. Harrod, *Towards a Dynamic Economics* (London, 1948); E. D. Domar, "Expansion and Employment," *Am. Econ. Rev.*, Mar. 1947, XXXVII, 34–55, and "The Problem of Capital Accumulation," *ibid.*, Dec. 1948, XXXVIII, 777–94.

unused land is brought into use, the full-employment output will grow over time. The increase in capacity in year t (compared to year $t-1$) we will call $I_{t-1}\cdot\sigma$, where I_{t-1} represents net investment in year $t-1$, and σ is the ratio of the increment in output to the increment of capital.[14] We will assume σ to be constant. The term $I_{t-1}\cdot\sigma$ represents the increment in aggregate supply in year t. Part of this increase in output will be purchased by domestic consumers or by businessmen for new capital formation. That portion not taken by domestic buyers we assume to be exported, and world demand is assumed to be of such high elasticity that no fall in price is required. We assume the marginal propensity to consume to be constant fraction, equal to $(1-s-m)$ where s is marginal propensity to save, m is marginal propensity to import. The portion of the increment in supply that is available for increase in domestic investment and for export thus equals $I_{t-1}\cdot\sigma(s+m)$. That is, if ΔX is the increase in exports:

$$\Delta I + \Delta X = (s + m)I_{t-1}\cdot\sigma, \tag{1}$$

and

$$\Delta X = (s + m)I_{t-1}\cdot\sigma - \Delta I.$$

Exports and domestic capital formation are competing uses for the excess of new supply over domestic consumption.

The rise in money income we take to be equal to $I_{t-1}\cdot\sigma$, and we have $Y_t = Y_{t-1} + I_{t-1}\cdot\sigma$, where Y_t is aggregate money income in the year t. The rise in imports[15] is:

$$\Delta M = m\cdot I_{t-1}\cdot\sigma. \tag{2}$$

If we impose a condition that $\Delta X = \Delta M$, we have, from (1) and (2):

$$(s + m)I_{t-1}\cdot\sigma - \Delta I = m\cdot I_{t-1}\cdot\sigma.$$

$$\frac{\Delta I}{I_{t-1}} = s\cdot\sigma. \tag{3}$$

That is, the rate of growth the economy can achieve with no adverse movement in the balance of trade is equal to $s\cdot\sigma$.[16] If the rate of growth

[14] The increase in output is not attributable solely to the increase in the stock of capital. Instead, the contributions of increases in labor force and in land utilization are included in σ.

[15] Here we assume a constant marginal propensity to import. Actually, it might not be constant, as in the case of investment in import-competing industries.

[16] This is comparable to Domar's conclusion for a closed economy. It differs from the author's previous statement (*op. cit.*) because of a difference in an underlying assumption. There it was assumed that annual increases in investment produced a multiplier effect upon money income and output *in addition to* the rise in income associated with the expansion of capacity. Here we are assuming the annual increase in investment generates a rise in income that just keeps pace with the expansion of capacity. Essentially, the present formulation expands σ to take account of the growth in factors of production other than capital. If properly stated, both methods will yield the same result.

in domestic investment exceeds this limit, the trade balance will turn passive. Exports may rise, but not so much as imports.[17]

Under the assumption that the authorities permit an expansion of the money supply sufficient to permit money incomes to rise by the same proportion as output rises, we have a basis for predicting the behavior of income, exports, and imports. After estimating values for s, m, and σ, we may take the *actual* values for annual investment and obtain predictions for the variable under study.

The domestic expansion is likely to lead to changes in prices which will further strengthen the effects described above. Expected price changes are in every way consistent with those indicated by conventional analysis. We do not challenge this part of the accepted analysis; we wish merely to supplement it. To show the suggested supplement in the most forceful way, we shall assume that no price changes occur. Even in this extreme case the necessary balance-of-payments adjustment may take place, and in a more "realistic" case, where price changes are permitted, the adjustment process becomes much easier to explain.

II. *Application of the Model to Canada, 1900–1913*

The rapid growth of the Canadian economy in the period 1900 to 1913 is well known. The labor force was augmented by a large natural increase as well as by heavy immigration. A vast supply of unused fertile land existed, large amounts of which were drawn into use as population grew and transport facilities were extended. The rate of capital formation was high, and tended to rise during the period. Table I contains some statistics which illustrate the growth in productive capacity. Buckley[18] has estimated that gross national product rose from an aggregate of $5.65 billion for the five-year period 1901–05 to $8.48 billion for the period 1906–10 and to $12.18 billion for the period 1911–15.

It seems clear that the full employment output rose steadily over the period. Although minor recessions of economic activity occurred, especially in 1904 and 1908, our assumption of full employment is not too wide of the mark.

Using Buckley's estimates of gross national product and Viner's estimates of imports,[19] we obtain an estimate of the marginal propensity

[17] When ΔI is so great that ΔX is zero, we have:

$$\Delta I = (s + m) \cdot I_{t-1} \cdot \sigma$$

$$\frac{\Delta I}{I_{t-1}} = (s + m) \cdot \sigma.$$

At this rate of growth, imports rise but exports do not, because domestic demand rises enough to purchase the whole of the increment in supply. If the rate of growth were still greater, exports would decline.

[18] K. A. Buckley, *Capital Formation in Canada, 1896–1930* (Toronto, 1955), p. 135.

[19] Viner, *Canada's Balance*, Pt. I., *op. cit.* We omit interest and gold imports from Viner's figures.

TABLE I.—SELECTED INDICATORS OF GROWTH

	1901	1906	1911
Population[a]	5,371,000	6,171,000	7,207,000
Labor force[b]	1,783,000		2,724,000
Value of capital in manufacturing[c]	$447,000,000	$846,000,000	$1,247,000,000
Value of product in manufacturing[c]	$481,000,000	$718,000,000	$1,166,000,000
Area of occupied land (acres)[d]	63,000,000		110,000,000
Value of agricultural capital (ex. land)[e]	$780,000,000		$1,705,000,000
Value of agricultural output[e]	$365,000,000		$ 663,000,000
National index of urban building activity (1900=100)[f]	120	409	797

[a] 1901, 1906—*Canadian Yearbook*, 1931; 1911—*Sixty Years of Canadian Progress, 1867–1927* (Ottawa, 1927).
[b] *Canadian Yearbook*, 1915.
[c] *Canadian Yearbook*, 1905, 1909, 1913.
[d] *Canadian Yearbook*, 1913.
[e] Board of Inquiry into the Cost of Living, Canada, *Report of the Board* (Ottawa, 1915), Vol. II, Ch. 3.
[f] Buckley, *op. cit.*, p. 141.

to import of 25 per cent. Buckley's work also suggests a marginal propensity to save of 15 to 20 per cent. We shall use 15 per cent. On the basis of slender statistical evidence concerning incremental changes in output and capital, some of which is contained in Table I, we set $\sigma = .5$. We assume a one-year gestation period. Annual estimates of fixed capital formation are given by Cairncross,[20] who obtained them from Buckley. This series is an unsatisfactory one to use as "investment" in our model on three counts: it is gross, not net; it excludes inventory changes which are not available on an annual basis; and it excludes government capital formation except in government enterprises. Nevertheless it is the best available series. The most serious omission is inventory change; the other defects may partly counteract each other.

Given the actual amount of domestic investment and the assumed values for s, m, and σ, we may calculate ΔY, ΔX and ΔM for the years 1900 to 1913. These projections are shown in Table II. If we take the actual value of exports and imports in 1900 as a starting point, we may use the calculated changes to project total imports and exports for each year of the period. These projections are also exhibited in Table II, along with the projected balance on current account (cols. 7–9).

The projections made on the basis of our simple model may now be compared with the actual figures. The latter are given in Table II, cols.

[20] A. K. Cairncross, *Home and Foreign Investment, 1870–1913* (Cambridge, Eng., 1953), p. 45. Cairncross' essay (Ch. 3 in this volume) is an excellent account of the Canadian episode 1900–1913. He stresses the growth in the economy, but despite his introduction he does not explicitly incorporate changes in capacity into the balance-of-payments mechanism.

TABLE II.[a]—ACTUAL AND PROJECTED EXPORTS AND IMPORTS

(millions of Canadian dollars)

Year (1)	Gross Domestic[b] Investment (2)	ΔI (3)	ΔY $(=I_{t-1}\cdot\sigma)$ (4)	ΔM $(=m\cdot\Delta Y)$ (5)	ΔX[c] (6)	Total Imports[d] (projected) (7)	Total Exports[d] (projected) (8)	$(X-M)$ (projected) (9)	Total Imports[e] (actual) (10)	Total Exports[e] (actual) (11)	$(X-M)$ (actual) (12)
1900	179	—	—	—	—	203	206	3	203	206	3
1901	187	8	89	22	28	225	234	9	213	230	7
1902	229	42	93	23	−5	248	229	−19	240	253	13
1903	284	55	114	28	−9	276	220	−56	290	268	−22
1904	288	4	142	36	53	312	273	−39	282	240	−42
1905	329	41	144	36	17	348	290	−58	314	280	−34
1906	407	78	164	41	−12	389	278	−111	374	328	−46
1907	476	69	203	51	12	440	290	−150	445	336	−109
1908	424	−52	238	59	147	499	437	−62	368	333	−35
1909	500	76	212	53	9	552	446	−106	439	363	−76
1910	576	76	250	62	24	614	470	−144	539	385	−154
1911	686	110	288	72	5	686	475	−211	623	394	−229
1912	810	124	343	86	13	772	488	−284	786	470	−316
1913	829	19	405	101	143	873	631	−242	833	567	−266

[a] In the projections it is assumed that $s=.15$, $m=.25$, $\sigma=.50$.
[b] Cairncross, *op. cit.*, p. 45. Inventory changes are omitted from this series.
[c] Change in exports $=(s+m)I_{t-1}\cdot\sigma-\Delta I$.
[d] The actual figure for 1900 is used. It is taken from Viner, *Canada's Balance*, Pt. I. Interest and dividends, and imports of gold coin are omitted.
[e] *Loc. cit.* Interest and dividends, and imports of gold coin are omitted.

10–12. Actual exports rose in most years, but not so rapidly as did imports, and the current account deficit widened during the period. Our projections display trends similar to those of the actual figures. This may be seen in Figure 1, where actual and projected exports and imports are compared, and in Figure 2, where the actual and projected balances on current account are shown graphically.

The model clearly produces a behavior of exports, imports, and balance on current account that corresponds well with the observed experience. Explicit allowance for the role of growth in capacity thus supplies an explanation for the flaw in conventional analysis.

Our model is also consistent with the known facts about the state of the money market in Canada, whereas the conventional model is not. If the causal sequence were to run from an influx of foreign funds to a rise in the supply of money, and then to the effects thereby involved, it would imply an initial increase (and subsequent additional increases) in the supply of funds such that downward pressure would be exerted on the interest rate. Money would be easy. This is the direct opposite of what we find, however. This was a period of tight money and rising rates of interest, which suggests that domestic expansion was at least coordinate with the inflow of foreign funds if not the leading cause of the observed events.

Viner was of course aware of Canada's growth. He refers to a suggestion put forward by the Dominion statistician, R. H. Coats,[21] that the price behavior and capital inflow might be the results of domestic expansion in Canada, but Viner gives this argument short shrift. He says, in a curiously dated passage, that:

> If expansion . . . in a given country was financed from domestic savings, it would simply mean . . . that those having purchasing power were voluntarily shifting their demand from consumers' goods to producers' goods and from labor engaged in producing consumers' goods to labor engaged in industrial development. What might be expected to happen would be that producers' goods would rise and consumers' goods would fall in price. The general price level should not be affected by this change in the character of the demand. On the other hand, if the expansion was financed by borrowings from abroad, there would still be available the normal supply of consumers' goods, the extra supply of goods and labor necessary for the industrial development being provided directly or indirectly by the lending country. Insofar as the industrial expansion *per se* was concerned, there would again be no obvious reason why prices should rise more rapidly in this than in other

[21] Board of Inquiry into the Cost of Living, *Report of the Board, op. cit.* This remarkable state document contains a thorough analysis of the nature and causes of Canadian expansion and inflation in the period 1900–1913. Emphasis is placed upon the expansion of productive capacity in explaining the rise of prices and the adverse balance of trade.

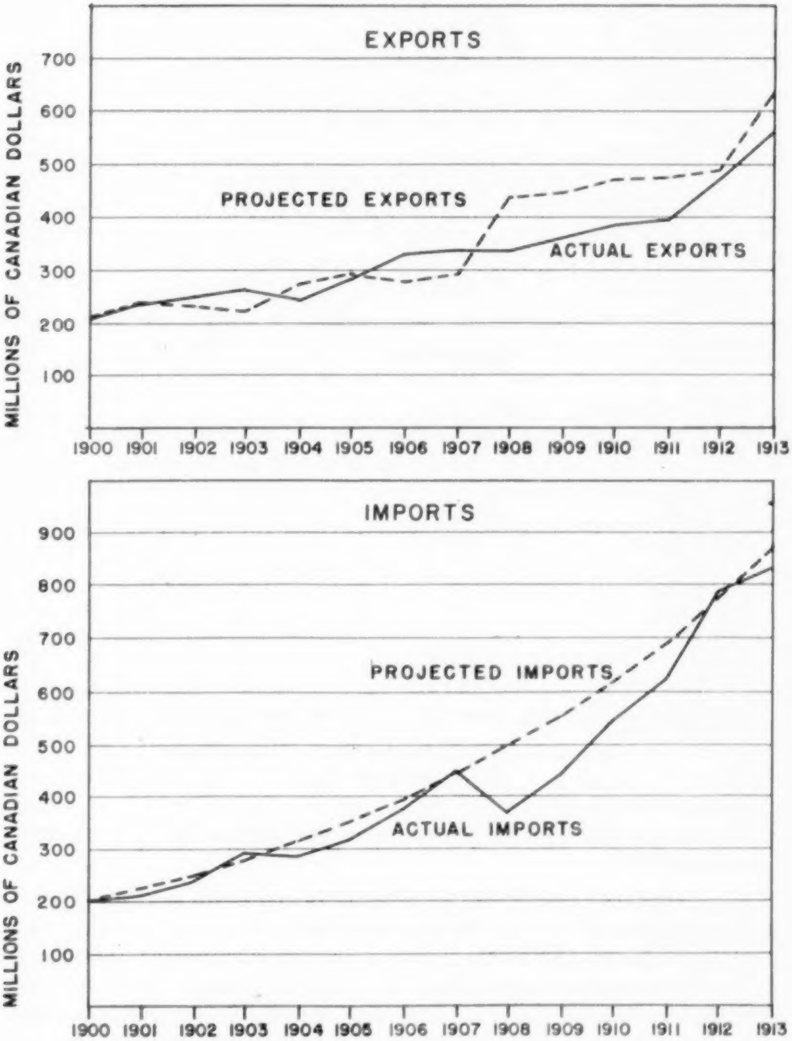

FIGURE 1. ACTUAL AND PROJECTED EXPORTS AND IMPORTS
Source: Table II.

FIGURE 2. CURRENT ACCOUNT BALANCE (ADJUSTED)
Source: Table II.

countries, and there would even be some reason for expecting a relative fall in prices.[22]

Viner appears to deny that an increase in aggregate demand is possible, even in the short run. He suggests that an increase in demand for capital goods can occur only if demand for consumers' goods is simultaneously reduced—except when an inflow of foreign funds occurs—and thus he sees no way for Canadian industrial expansion to cause rising prices or to affect the balance of payments. Our thesis is that the expansion of aggregate demand may cause incomes and prices to rise and this, though modified by the expansion of supply, may cause an

[22] Viner, *op. cit.*, p. 249.

adverse trade balance to appear. Unless an inflow of foreign capital then occurs, the domestic expansion will be halted.[23]

Viner recognized that exports did not behave as his theory would indicate. He discussed this briefly, but devoted much more space to the argument that exports were "checked" by the capital inflow—that is, exports rose less than they would have risen in the absence of the capital inflow.[24] This is a difficult comparison to make, however, because the *ceteris paribus* assumption cannot hold. Had the capital inflow not occurred, the rate of expansion would have been smaller, productive capacity would have grown less rapidly, and exports might have been smaller, not larger. If the capital inflow could be separated from the process of growth in the Canadian economy, Viner's argument would be valid. Our contention is that the two are inseparable so far as the analysis of Canadian experience in this period is concerned, though not theoretically.

Except for his discussion of the "check" and "restrictive effect" of capital inflow on exports, Viner does not grapple with the fact that exports rose in both volume and value. He notes that the theory calls for a fall in exports and says: "The general expansion of industry and trade operated independently of the influence of the capital borrowings, to increase both imports and exports."[25] But, since industrial expansion and capital borrowing are closely related, as Viner himself recognizes, it would seem necessary to incorporate both factors into a theory of balance-of-payments adjustment.

If Canadian investment had risen more rapidly than it did, our theory suggests that demand might have risen enough to reduce exports. But in such a case capacity would also have risen more rapidly, and in time the supply effects would have caught up with the demand effects—unless, of course, the rate of increase in investment was sustained. On the other hand, a smaller rate of growth could have been achieved with no adverse balance of trade, and hence with no capital inflow.

III. *Limitation on Results*

The preceding demonstration that Canadian balance-of-payments experience can be explained without reference to price changes will not lead us to claim that price movements were of minor importance. No such suggestion is made here. Nor is the relatively good fit considered to be particularly significant. Both Viner and Meier explicitly rejected

[23] We do not insist that domestic expansion must be the leading cause, but merely that it is possible. Viner denies the possibility.

[24] Viner, *op. cit.*, pp. 261 ff.

[25] *Ibid.*, p. 261.

any attempt to use the available statistics for precise analytical purposes, and we have no wish to venture into this forbidding area. All we have shown is that it is *possible* for Canadian expansion to affect the balance of payments in a manner consistent with the observed facts. Intermingled with the price and income effects of conventional analysis, we suggest that there is a capacity effect whose presence adds to the clarity and completeness of the theory.

Some efforts were also made to analyze other decades of Canadian experience and to demonstrate the role of the capacity effect through time. In most cases, however, powerful forces were present whose effects were so dominant that they obscured the issue. It became ever more apparent that Taussig and Viner had indeed chosen an ideal "laboratory case" for the study.

For the period 1933 to 1941 it is possible to distinguish the capacity effect. Gross investment rose rapidly and steadily in these years, and there was a surplus on current account.[28] Exports rose more than imports did. The size and changes in the current-account balance were consistent with our general hypothesis, and price movements were not very substantial.

The experience following the second world war also seems consistent with our theory. Investment has been high and (with occasional exceptions) rising every year. In the early postwar years Canada had a surplus on current account, and exports steadily rose to match or exceed the rise in imports. Later the rate of expansion (and also heavy government outlays) outstripped the capacity effect and Canada began to experience a deficit on current account and an inflow of foreign capital. Even in these years (1950–52) exports continued to rise.

[28] *National Accounts Income and Expenditure, 1926–1950*, Canada, Bureau of Statistics (Ottawa, 1953); *The Canadian Balance of International Payments, 1926 to 1948*, Canada, Bureau of Statistics (Ottawa, 1949).

INPUT-OUTPUT COEFFICIENTS AS MEASURES OF PRODUCT QUALITY

By HANS BREMS*

It has long been recognized that the nonprice variables in the theory of the firm are at least as important as the price variable. But the road to a satisfactory quantitative treatment of those variables has been blocked by the following dilemma. Some aspects of product quality and selling effort are thought of as being nonquantitative. As far as selling effort is concerned, this difficulty traditionally has been overcome by using not selling effort itself but selling-effort expenditure, which is always quantitative, as the variable to be optimized. If this were a satisfactory approach, it could obviously be used for nonquantitative aspects of product quality, too. But it is not a satisfactory approach for selling effort any more than for product quality, for selling effort and product quality are both multidimensional. Moreover, from the point of view of demand, alternative dimensions may be substitutional. For example, quantity sold might rise if the input of aluminum were to be substituted for the input of steel, or if television advertising were substituted for magazine advertising. It is not enough, then, to seek the optimal total expenditure. Somewhere in the firm, a decision-maker must know exactly how far to go in each particular dimension of quality and selling effort.[1]

* The author is professor of economics at the University of Illinois. For encouraging criticism of earlier drafts of this paper he is grateful to Carl F. Christ, Sven Danö, Robert Dorfman, Wassily Leontief, Nörregaard Rasmussen, Frederick Williams, and Frederik Zeuthen.

[1] Most of the literature fails to answer this question. Chamberlin, in his *Monopolistic Competition*, was the first to ask it but felt that the answer would be hampered by the small extent to which quality might be reduced to quantitative terms. He now thinks that the extent was definitely underestimated in *Monopolistic Competition; cf.* his "The Product as an Economic Variable," *Quart. Jour. Econ.*, Feb. 1953, LXVII, 8. Four other prominent contributions have assumed either that quality and selling effort are both one-dimensional or that the expenditure on quality variation and selling effort can be taken to represent quality itself or selling effort itself, *i.e.*, H. v. Stackelberg, "Theorie der Vertriebspolitik und der Qualitätsvariation," *Schmollers Jahrbuch*, 1939, LXIII, 43–85; L. Abbott, "Vertical Equilibrium under Pure Quality Competition," *Am. Econ. Rev.*, Dec. 1953, XLIII, esp. 830–31; R. Dorfman and P. O. Steiner, "Optimal Advertising and Optimal Quality," *ibid.*, Dec. 1954, XLIV, esp. 827, 832; and A. Rasmussen, *Pristeori eller parameterteori* (Copenhagen, 1955), pp. 195, 203. But Stackelberg and Dorfman-Steiner clearly saw and solved the substitution problem as between quality as a whole and selling effort as a whole. A refined graphical solution of the substitution problem as between different advertising media was offered twenty years ago by Børge Barfod, *Reklamen i teoretisk-økonomisk Belysning* (Copenhagen, 1937). Two contributions have solved the substitution problem as between all the dimensions of quality and selling effort, *i.e.*, T. Scitovsky, *Welfare and Competition* (Chicago, 1951), n. 7, 259, and my own *Product Equilibrium under Monopolistic Competition* (Cambridge, Mass., 1951), Ch. 5.

The present paper suggests that certain assumptions developed by Leontief for entirely different purposes may provide a satisfactory solution to the dilemma just described. Quality and selling effort can simply be defined as a complete specification of the production and distribution process of the product in question. Such a complete specification has two elements in it. First, a specification of the following form. To produce and sell the physical quantity X_j per unit of time of the product of the jth industry takes the input of the physical quantity x_{ij} per unit of time of the product of the ith industry, including labor, where $i=1 \cdots m$. Such inputs are purchasable and have prices attached to them, and they should not be confused with their own properties.[2] A specification of the inputs can also be stated in terms of input *coefficients* as follows. To produce and sell the physical quantity X_j per unit of time of the product of the jth industry takes the input of a_{ij} physical units of product of the ith industry per unit of product of the jth industry.

Under Leontiefian assumptions, for a given product, a_{ij} is independent of the level of output X_j. Precisely for that reason we are free to let a_{ij} represent quality and selling effort. If the Leontiefian assumptions were not used, we would not know whether a change in a_{ij} would reflect a change in the level of output or would reflect a change in the quality of the product or the selling effort accompanying it. Leontiefian assumptions exclude the former possibility. Thus a change in the input coefficient for labor will always reflect a change in the workmanship of the product, a change in the input coefficient for a certain material will always reflect a change in the product property depending upon that material, say purity, hardness, tensile strength, heat resistance, etc. Even for selling effort, in fact, such an approach comes very close to the businessman's mode of thinking. There is some evidence that most businessmen try to maintain a constant proportion between advertising and sales.[3] They would think of an increase in that proportion as more intensive selling effort, of a decrease as less intensive selling effort.

The second element needed for a complete description of how to produce and distribute the product is a specification of the order in time of the inputs. Certainly it would do no good to perform the process of,

[2] H. B. Chenery, in "Engineering Production Functions," *Quart. Jour. Econ.*, Nov. 1949, LXIII, 507–31, and "Process and Production Functions from Engineering Data," *Studies in the Structure of the American Economy* (New York, 1953), 297–325, has emphasized the distinction between the inputs and their properties. The former are purchasable and have prices, the latter do not. The former are called "physical inputs" or "economic quantities," the latter are called "engineering variables."

[3] R. W. Jastram, "Advertising Outlays under Oligopoly," *Rev. Econ. Stat.*, May 1949, XXXI, 106–09. Similar findings are reported by the Committee on Price Determination, National Bureau of Economic Research in *Cost Behavior and Price Policy* (New York, 1943), Ch. 9.

say, painting an automobile body by first applying the baked enamel, then two primer coats, and finally doing the bonderizing. The timing, however, is frequently so obvious that no explicit reference to it is found. Such is the case in the Leontief system.

I. *The Model*

Everything now being measurable, we can make the theory of nonprice competition every bit as quantitative as, say, the theory of production. The following notation will be used:

a_{ij} = the number of physical units of the product of industry i absorbed per unit of product of a firm in industry j.

c_j = the number of dollars of cost incurred annually by a firm in industry j.

p_j = the number of dollars of profits earned annually by a firm in industry j.

π_i = the price of the input absorbed from industry i, a parameter.

π_j = the price of the output produced by a firm in industry j.

x_{ij} = the number of physical units of the product of industry i absorbed annually by a firm in industry j.

X_j = the number of physical units of product produced and sold annually by a firm in industry j.

Our firm in industry j is assumed to produce only one product and to absorb as inputs the products of industry i, where i stands for m industries, including labor. The first fundamental equation needed in our analysis is the demand equation faced by the firm:

$$X_j = X_j(\pi_j, a_{ij}) \text{ for } i = 1 \cdots m. \tag{1}$$

The equation says that demand depends upon price and all the input coefficients. Directly, of course, the consumer's attitude is determined by his appraisal of the appearance and expected performance of the product, but the latter, in turn, are determined by the complete specification of the production and distribution process of the product as revealed by the list of input coefficients. Doing some violence to reality we shall assume that the demand equation (1) is continuous and differentiable.

The second fundamental equation in our analysis is the cost equation, also assumed to be continuous and differentiable:

$$c_j = \sum_{i=1}^{m} (\pi_i x_{ij}), \tag{2}$$

where:

$$x_{ij} = a_{ij} X_j \text{ for } i = 1 \cdots m. \tag{3}$$

Equation (2) is a definitional equation. When interpreted in the Leontief tradition, equation (3) becomes a behavior equation. In this tradition, for a given product, the input coefficient a_{ij} is not allowed to vary with the level of output. Only under this assumption are we free to let a_{ij} represent quality and selling effort. Taking (2) and (3) together, we can write cost as:

$$c_j = X_j \sum_{i=1}^{m} (\pi_i a_{ij}). \tag{3a}$$

Finally, we need the definitional equation saying that profits equal revenue minus cost:

$$p_j = \pi_j X_j - c_j. \tag{4}$$

II. *Quality Equilibrium*

Let us vary one input coefficient a_{ij} in isolation, and let us take the partial derivative of profits p_j with respect to that input coefficient a_{ij}:

$$\frac{\partial p_j}{\partial a_{ij}} = \pi_j \frac{\partial X_j}{\partial a_{ij}} - \left[\pi_i X_j + \frac{\partial X_j}{\partial a_{ij}} \sum_{i=1}^{m} (\pi_i a_{ij})\right].$$

Here, the a_{ij} appearing under the summation sign is the general a_{ij} where, as indicated, $i=1 \cdots m$. The three other a_{ij}'s, outside the summation sign, represent the specific input coefficient now being varied in isolation.

Now let η_{ij} be the elasticity of demand[4] faced by the firm in industry j with respect to the input coefficient a_{ij}. Setting the above partial derivative equal to zero and rearranging, one gets:[5]

$$\eta_{ij} = \frac{\partial X_j}{\partial a_{ij}} \frac{a_{ij}}{X_j} = \frac{\pi_i a_{ij}}{\pi_j - \sum_{i=1}^{m} (\pi_i a_{ij})} \tag{5}$$

This result can be expressed as follows: The input of the product of the ith industry into the product of the jth industry should be adjusted in such a way that the expenditure for that input per unit of output of the jth industry divided by the profit per unit of output of the jth

[4] Our η_{ij} is not identical with the η_c used by Dorfman and Steiner, *op. cit.*, p. 833 and defined as the percentage change in demand to the percentage change in *average cost*, both induced by a small change in quality. Comparison of our results with those of Dorfman-Steiner may be facilitated by the following comparison of notation: Our quality index is a_{ij}, theirs is x; our product price is π_j, theirs is p; our demand function is $X_j = X_j(\pi_j, a_{ij})$, theirs is $q=f(p, x)$; our unit cost is $\sum_{i=1}^{m} (\pi_i a_{ij})$, theirs is $c=c(q, x)$. To the extent that our problems are identical with theirs, solutions are identical, too.

[5] *Cf.* Rasmussen, *op. cit.*, p. 203.

industry equals the elasticity of demand faced by the firm of the jth industry with respect to the input coefficient a_{ij}. So far, this sounds rather complicated; but paradoxically, things get much simpler as the analysis is extended.

That the partial derivative of profits p_j with respect to the input coefficient a_{ij} is zero is a necessary, but not a sufficient, condition for profit maximization. We must also show that the second derivative of profits p_j is negative, *i.e.*, that:

$$\frac{\partial^2 p_j}{\partial a_{ij}^2} = \frac{\partial^2 X_j}{\partial a_{ij}^2}\left[\pi_j - \sum_{i=1}^{m}(\pi_i a_{ij})\right] - 2\pi_i \frac{\partial X_j}{\partial a_{ij}} < 0.$$

Over the relevant range, let it be assumed that the quality-quantity relationship can be illustrated by a curve similar to the one shown in

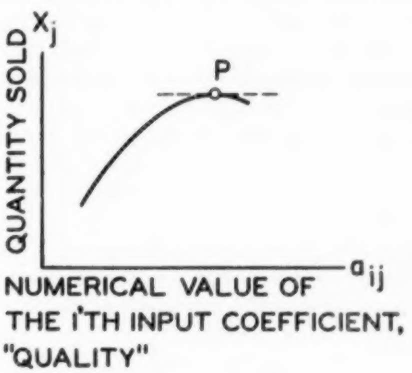

FIGURE 1

Figure 1. Here, as any input coefficient a_{ij} is increased, quantity X_j should become less and less responsive to it. Such an assumption is reasonable both for quality and for selling effort. While consumers seem to appreciate an increase of the horsepower of a passenger car from 150 to 200, they could not possibly use an increase from 500 to 550. Selling effort, no doubt, too can be increased *ad nauseam*. Consequently, the second derivative of X_j with respect to a_{ij} is negative. The expression in brackets represents profit per unit of output which is positive. The entire first term, then, is negative. In the second term, π_i is positive, and up to the point P, the first derivative of X_j with respect to a_{ij} is positive. Consequently, in that range, the entire second derivative of profits p_j is negative, and we have a true maximum.

If not one but all dimensions of quality and selling effort are manipulated, equation (5) holds simultaneously for *any* i. Write it in the form:

$$\text{(5a)} \qquad \frac{\pi_i}{\dfrac{\partial X_j}{\partial a_{ij}}} = \frac{\pi_j - \sum_{i=1}^{m} (\pi_i a_{ij})}{X_j}$$

holding for any i. Consequently, we can write:

$$\text{(5b)} \qquad \frac{\pi_1}{\dfrac{\partial X_j}{\partial a_{1j}}} = \frac{\pi_2}{\dfrac{\partial X_j}{\partial a_{2j}}} = \cdots = \frac{\pi_m}{\dfrac{\partial X_j}{\partial a_{mj}}}.$$

Consisting of m equations, one for each dimension of product and selling effort, system (5a) of simultaneous equations represents the solution of the substitution problem: How far should quality and selling effort be carried in each particular one of the m possible dimensions? System (5a) and (5b) could never, of course, have been formulated had not every dimension of quality and selling effort been made quantitative.

Equation (5b) says that in equilibrium, quality has been improved and selling effort been intensified, in each of the m possible dimensions, until the ratio between the price of an input and the marginal "productivity" of the corresponding input coefficient is the same for all m inputs. The similarity to the neoclassical theory of production and distribution is evident. But there are two differences. First, "productivity" is productivity in selling, not just in producing. Second, condition (5b) runs in terms of input coefficients, not just inputs.

Once every dimension of quality and selling effort has been made quantitative, a clear meaning can be attached to the concept "quality elasticity of demand," and the concept can be put to good use. We said that equation (5) must hold for any i. Adding together all the m versions of the equation one gets:

$$\text{(6)} \qquad \mathrm{H} = \sum_{i=1}^{m} \eta_{ij} = \frac{\sum_{i=1}^{m} (\pi_i a_{ij})}{\pi_j - \sum_{i=1}^{m} (\pi_i a_{ij})}.$$

The meaning of this aggregate elasticity H, the sum of all the elasticities η_{ij}, can be clarified by the following hypothetical operation. Let the first input coefficient a_{1j} rise by one-nth of its numerical value and watch the effect upon quantity sold X_j. Next, let the second input coefficient a_{2j} rise by one-nth and watch the effect upon X_j. Continue in this way all through the m input coefficients. If n is sufficiently large, say 1,000, then the order in which we are increasing the a's does not

matter. Consequently, the sum H of all the *m* elasticities is equal to the number of *n*ths by which X_j would rise when *at the same time* every a_{ij} is increased by one-*n*th. In this aggregative sense, the concept "quality elasticity of demand" does have a clear quantitative meaning. Let us now rewrite (6) in the form:

$$\sum_{i=1}^{m} (\pi_i a_{ij}) = \pi_j \frac{H}{1 + H} \tag{6a}$$

which says that in equilibrium, unit cost should be carried, by means of quality improvement and intensification of selling effort, up to the point where it amounts to the fraction H/(1+H) of the price of the product. Equation (6a) runs in terms of unit cost relative to price, presumably in accordance with modes of thinking among businessmen, rather than in marginalist terms. This, however, should not conceal the fact that the present analysis is a thorough-going marginalist one. H is a sum of partial derivatives in disguise, consequently equation (6a) is an equation of margins. After all it was derived from a summation of (5) which, in turn, was based upon profit maximization by partial derivation. Equation (6a) includes unit cost only because under Leontiefian assumptions unit and marginal costs are equal. The relationship expressed by (6a) is shown graphically in Figure 2.

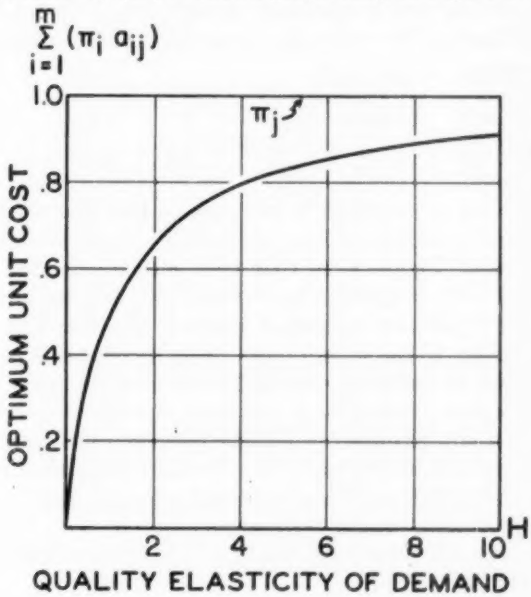

FIGURE 2

III. *Price Equilibrium*

Let us now vary price π_j in isolation, and let us take the partial derivative of profit p_j with respect to the price π_j:

$$\frac{\partial p_j}{\partial \pi_j} = \pi_j \frac{\partial X_j}{\partial \pi_j} + X_j - \frac{\partial X_j}{\partial \pi_j} \sum_{i=1}^{m} (\pi_i a_{ij}).$$

Now let e be the familiar Marshallian price elasticity of demand faced by the firm in industry j. Setting the partial derivative above equal to zero and rearranging, one gets:

$$e = \frac{\partial X_j}{\partial \pi_j} \frac{\pi_j}{X_j} = - \frac{\pi_j}{\pi_j - \sum_{i=1}^{m} (\pi_i a_{ij})}. \tag{7}$$

This result can be expressed as follows: The price π_j of the product of the jth industry should be adjusted in such a way that the price π_j divided by the profit per unit of output of the jth industry equals the Marshallian price elasticity of demand with opposite sign.

That the partial derivative of profits p_j with respect to the price π_j of the product is zero is a necessary, but not a sufficient, condition for profit maximization. We must also show that the second derivative of profits p_j is negative, *i.e.*, that:

$$\frac{\partial^2 p_j}{\partial \pi_j^2} = \frac{\partial^2 X_j}{\partial \pi_j^2} \left[\pi_j - \sum_{i=1}^{m} (\pi_i a_{ij}) \right] + 2 \frac{\partial X_j}{\partial \pi_j} < 0.$$

Over the relevant range, let it be assumed that the relationship between price and quantity sold can be described by a straight line with negative slope, *cf.* Figure 3. In that very special case, the second derivative of X_j with respect to π_j is zero. The expression in brackets represents profit per unit of output which is positive. The entire first term, then, is zero. In the second term, the derivative of X_j with respect to π_j is negative, so the entire second derivative of profits p_j is negative, and we have a true maximum. If the price and quantity-sold relationship were not a straight line but a curve concave to the origin, the second derivative of X_j with respect to π_j would be negative, and so both terms would be negative. If the relationship were a curve convex to the origin, the first term would be positive, but if the convexity were moderate, the positive first term would be small and still be outweighed by the negative last term.

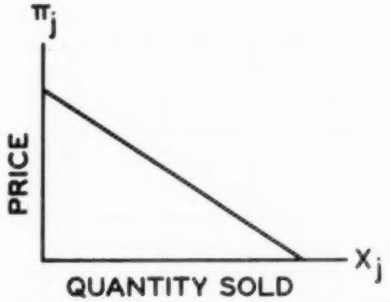

FIGURE 3

Write (7) in the form:

$$\pi_j = \frac{e}{1+e} \sum_{i=1}^{m} (\pi_i a_{ij}) \tag{7a}$$

which says that in equilibrium, price should be marked up to the point where it amounts to $e/(1+e)$ times the unit cost of the product, where e is the Marshallian price elasticity of demand for the product. Unlike (6a), (7a) is old and familiar.[6] Like (6a), (7a) runs in terms of unit cost relative to price, better understood by the businessman, but is really just as marginalist as the former. The relationship expressed by (7a) is shown in Figure 4.

IV. *Full Equilibrium*

If price and all dimensions of quality and selling effort are to be optimized, equations (6a) and (7a) will both have to be satisfied at the same time. Taking them together, one gets:

$$e + \mathrm{H} = -1. \tag{8}$$

This very simple result says that in equilibrium, *i.e.*, when everything has been fully adjusted, the sum of the price elasticity and the quality elasticity of demand, the latter defined in Section II above, should equal -1. The relationship expressed by equation (8) is shown graphically in Figure 5.

Equation (8) is a condition for full equilibrium, but in the real world, even disregarding ignorance, is it always possible to satisfy it? Under

[6] Joan Robinson, *The Economics of Imperfect Competition* (London, 1933), p. 54, says that monopoly optimum price is equal to marginal cost multiplied by $\epsilon/(\epsilon-1)$. Since (1) her ϵ is the numerical value of Marshallian price elasticity, so that $\epsilon = -e$, and (2) under Leontiefian assumptions unit and marginal costs are equal, our formula (7a) is identical with Joan Robinson's formulation.

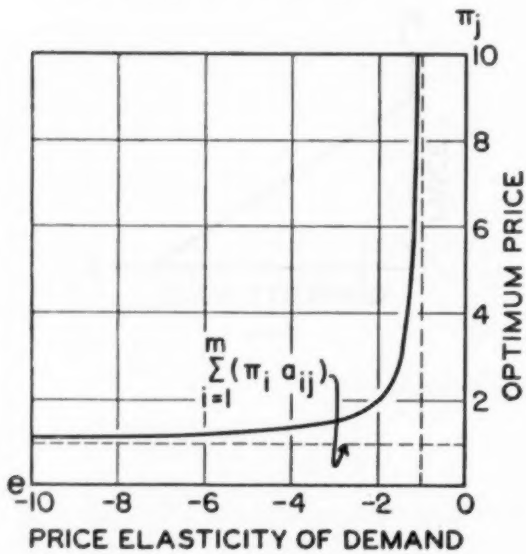

FIGURE 4

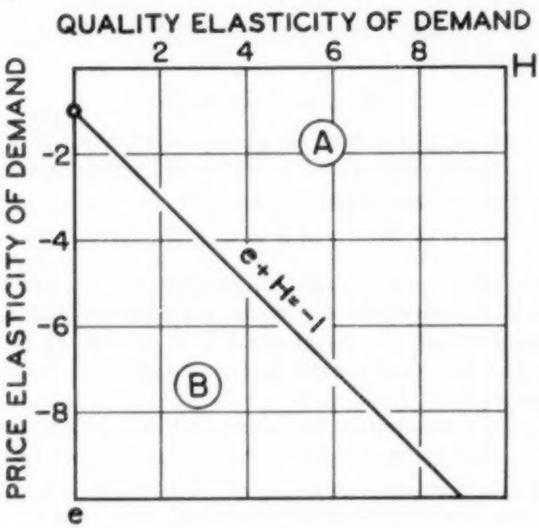

FIGURE 5

our assumptions, not unreasonable, it appears to be possible to satisfy equation (8).

First, it was assumed that the quality-quantity relationship could be illustrated by a curve similar to the one shown in Figure 1. Here, as any input coefficient a_{ij} is increased, quantity X_j should become less and less responsive to it. This being true of all input coefficients, at low numerical values of all the a_{ij}'s, the quality elasticity of demand, H, will be high but will become progressively lower, the higher the a_{ij}'s. Eventually it will turn negative (*cf.* point P in Figure 1).

Second, it was assumed that the relationship between price and quantity sold could be approximately described by a straight line with a negative slope (Figure 3). Here the Marshallian price elasticity of demand, e, at a high price π_j will be numerically in excess of unity and will be progressively higher, the higher the price. At a low price π_j it will be numerically less than unity and will numerically become progressively lower, the lower the price.

If these assumptions can be accepted, there *is* a solution satisfying equation (8). If the firm finds itself in the region A, where $e+\text{H}>-1$, it will be able to approach the line marked $e+\text{H}=-1$ in Figure 5 simply by raising both its price and its quality, still seeing to it that the system of equations (5a) is satisfied. In Figures 6 and 7 the effects of such simultaneous raising of price and quality are indicated. Figure 6 shows the usual price-quantity relationship. Raising the quality of the product will shift the price-quantity curve upwards. But since the quality elasticity of demand, H, has been assumed eventually to become progressively lower as a_{ij} rises, the demand curve must shift less and less than in proportion as a_{ij} rises. Eventually, raising price and quality simultaneously must take us into an area in which the price elasticity of demand is numerically extremely high.

Figure 7 shows the corresponding phenomenon on the quality side. Raising the price of the product will shift the quality-quantity curve downward. But since the price elasticity of demand, e, has been assumed eventually to become numerically progressively higher as π_j rises, the demand curve in Figure 7 must shift more and more than in proportion as π_j rises. Eventually, raising price and quality simultaneously must take us into an area in which the quality elasticity of demand is extremely low. But if the negative price elasticity e becomes numerically higher and higher, and if the positive quality elasticity H becomes lower and lower, a point must eventually be reached in which equation (8) is satisfied.

Similarly, if the firm should find itself on the other side of the line marked $e+\text{H}=-1$, *i.e.*, in region B (Figure 5), where $e+\text{H}<-1$. The firm can approach the line by reducing its price and its quality, again

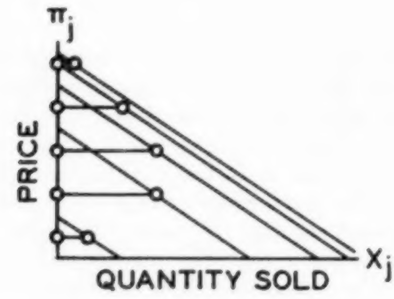

FIGURE 6

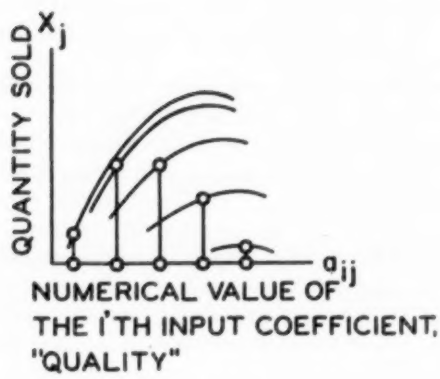

FIGURE 7

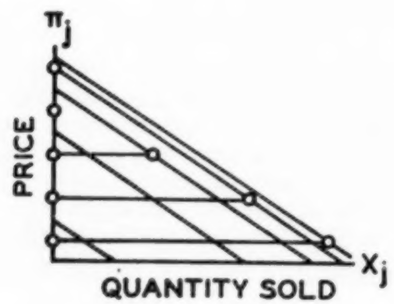

FIGURE 8

seeing to it that the system (5a) is satisfied. Price elasticity will go down numerically, and quality elasticity will go up.

On a priori grounds, one cannot rule out the possibility of several points existing at the same time satisfying equation (8). Suppose we have found one such point, located upon the line shown in Figure 5. Suppose, then, that we raise the quality and reduce the price of the product. Figure 8 shows the price-quantity relationship. Raising the quality of the product will shift the price-quantity curve upwards. But since the quality elasticity of demand, H, has been assumed eventually to become progressively lower as a_{ij} rises, the demand curve must shift less and less than in proportion as a_{ij} rises. Eventually, therefore,

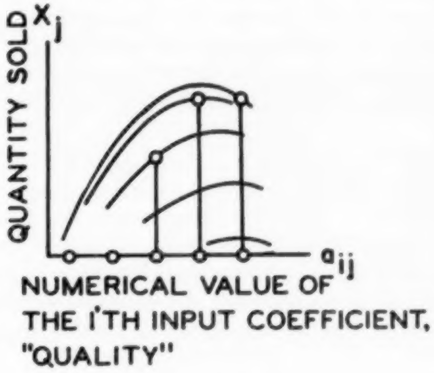

FIGURE 9

therefore, reducing price but raising quality simultaneously must take us into an area in which the price elasticity of demand is numerically quite low.

Figure 9 shows the corresponding phenomenon on the quality side. Reducing the price of the product will shift the quality-quantity curve upward. But since the price elasticity of demand, e, has been assumed eventually to become numerically progressively lower as π_j falls, the demand curve must shift less and less than in proportion as π_j falls. Eventually, reducing price but raising quality simultaneously may thus take us into an area in which the quality elasticity of demand is also quite low, while equation (8) is still satisfied.

V. *Limitations and Conclusion*

The Leontiefian assumption that for a given product, a_{ij} is independent of level of output represents our first limitation. It should be noted, however, that two restraints on the firm included in the model do oper-

ate somewhat like diminishing returns in the production function: first, the assumption that as price π_j is lowered, the numerical price elasticity will become progressively lower; and second, the assumption that as the input coefficient a_{ij} is increased, quantity sold X_j will become less and less responsive to it.

Like the static Leontief model, our model is ill-equipped to cope with those inputs that consist in the services rendered by durable capital stock. In a treatment of product quality this kind of input is likely to be quite important. Quality can be manipulated not only by varying workmanship or materials but also by varying the shape of things. Tools and dies will then have to be discarded and new ones installed. Such tools and dies will introduce the problem of indivisibilities, and they may well force us to abandon our assumption that the demand and cost functions are continuous and differentiable.

Another obvious limitation is the static profit-maximization assumption and the complete exclusion of rivals and their behavior, expected and real.

These limitations are common to most treatments of nonprice competition. The decisive difference between the approach suggested here and other approaches is that the adoption of the Leontiefian input-output coefficients as measures of product quality and selling effort will make the theory of nonprice competition every bit as quantitative as, say, the theory of production. Empirical research, so urgently needed in this field, may be expected to benefit greatly from such quantification.

PROFESSOR HICKS' *REVISION OF DEMAND THEORY*

A Review Article

By FRITZ MACHLUP*

The "demand theory" which Hicks is revising in his new book[1] is that of the first three chapters of his *Value and Capital*,[2] published in 1939. The original version was 42 pages long, the revision covers 194 pages. The new version goes deeper into the "foundations" and is more than patient in its "elaborations."

Among the chief reasons for undertaking the revision are the ascendancy of Samuelson's "revealed preference" approach (about which Hicks is sceptical), certain developments in the mathematical set theory of "strong" and "weak ordering" (of which Hicks gives a presentation which avoids mathematics), the discovery of a more closely reasoned derivation of the law of demand from a few simple propositions of logic, and the realization of some mistakes in his earlier treatment of consumer's surplus and complementarity.

The book falls into three parts: I. "Foundations"; II. "The Demand for a Single Commodity"; III. "The General Theory of Demand." There is no treatment of the "welfare side" of demand theory, nor of its empirical-statistical side, the book being confined to the deductive aspects of what Hicks calls "Plain Economics." He promises to present us with a statement of welfare economics at some later time. But empirical demand analysis, being "concerned with the statistical application of the theory rather than with the theory itself," is regarded by Hicks as outside his field (pp. vi–vii). Yet, "econometric application" is to him an important test, for "a theory which can be used by econometrists is to that extent a better theory than one which cannot" (p. 3).

A brief chapter is devoted to the rejection of (even hypothetically) measurable utility. Hicks holds that in the more elementary parts of the theory the assumption of cardinal utility neither helps nor hinders, but "in the more difficult branches cardinal utility becomes a nuisance" (p. 9). If one rejects, as one probably is forced to by rather simple reflection, the hypothesis of independent utilities, and if one grants the usefulness and possibility of dividing the effects of price changes into those of substitution and of changes in income, one has in effect eliminated cardinalism from the argument (pp. 11–15). Perhaps Hicks wanted to go further, for he elimi-

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[1] J. R. Hicks, *A Revision of Demand Theory* (Oxford: Clarendon Press. 1956. Pp. vii, 196. $3.75.)

[2] J. R. Hicks, *Value and Capital* (Oxford, 1939).

nated even the word "utility" from most of the rest of the book. But is this more than a terminological gesture? The pages are full of "levels of indifference," which after all are not really different from levels of satisfaction or utility; several times the term "real income" is used as an equivalent (*e.g.*, p. 80); and finally there is much discussion of "the consumer's valuation" of units of goods, "average valuation" as well as "marginal valuation," of the practical unimportance of "cases of increasing marginal valuation," of the position of equilibrium where the consumer's marginal valuation of a good is equal to its price (pp. 89–90), of the theorem of the "Additivity of Marginal Valuations" and the "generalized law of Diminishing Marginal Valuation" (p. 153). I cite this list without any critical intent; on the contrary, I approve the introduction of new terms where it is desired to avoid some of the connotations associated with old terms. But the old-fashioned utility theorists, cardinal, semicardinal, as well as ordinal, may note with a sense of satisfaction that the "newfangled" techniques are not so very far removed from their good old ways.

The methodological position underlying Hicks' approach is eminently sound. He is free from positivist-behavioristic restrictions on the study of consumers' behavior, and he also avoids contentions about the supposedly empirical assumptions regarding rational action. Instead, he starts from a fundamental postulate, the "preference hypothesis." Faced with factual data about quantities of commodities purchased and with the task of explaining changes in these quantities, the economist has at least three possibilities: explanations in terms of nonprice data, explanations in terms of effects of current price changes, and explanations in terms of lagged effects of price changes. No matter which of the explanations seems most pertinent, one "needs a technique for separating out the current-price effects from the others," and for this purpose one needs a theory "which will tell us something about the ways in which consumers would be likely to react if variations in current prices and incomes were the only causes of changes in consumption." Thus we must proceed "by postulating an *ideal consumer*, who by definition is only affected by current market conditions. . . . The assumption of behaviour according to a scale of preferences comes in here as the simplest hypothesis . . . " (p. 17). No direct test of the preference hypothesis is practically possible (pp. 17 and 58). It is a postulate accepted because of its fertility in deduced "consequences that can be empirically applied" in the sense that they are successful in aiding "the arrangement of empirical data in meaningful ways" (pp. 17–18).

I. *The Logic of Weak Ordering and the Elementary Law of Demand*

Since the "demand theory, which is based upon the preference hypothesis, turns out to be nothing else but an economic application of the logical theory of ordering" (p. 19), the reader will first have to take the lesson Hicks offers on the "logic of order." He must learn the difference between ***strong*** ordering, where each item has a place of its own in the order, and ***weak*** ordering, where some items may be clustered in a group within which none can legitimately be put ahead of the others. (The indifference curve, he is

told, implies weak ordering inasmuch as all the points on that curve are *equally* desirable, whereas the "revealed preference" approach implies to Hicks that the positions between which choice is actually made can be strongly ordered.) Hicks teaches this lesson in logic in a relatively painless way, using chiefly examples involving the consistency and transitivity of propositions about the spatial positions of certain things to the left or right of one another. Without graphical support, his examples of "items left of *P*" and "items right of *P*" (pp. 26–35) may trouble readers who are alert to the possibility that *Q* may be left or right of *P* depending on the position of the observer or on the direction in which *P* or *Q* is facing. Forgetting this relativity of right and left, readers may learn, as Hicks wants them to, the distinctions between, and applications of, "two-term consistency conditions" and "transitivity conditions." And the most flexible, studious and docile of the readers may actually keep these conditions in mind ready to be produced to demonstrate certain theorems of demand theory. Older teachers of theory, including the present reviewer, will probably forget enough of these lessons to force them to stick with their accustomed didactic techniques.

In the explanation of the consumer's choice between two goods which are available only in discrete units, the theory of strong ordering seems superior. But where the choice is between any good which may be imperfectly divisible and money which is finely divisible, the possibility of equally desired combinations must be accepted and "strong ordering has to be given up" (p. 41). Weak ordering implies that rejected positions need not be inferior to a position actually chosen, but may have been indifferent; hence, actual choice fails to reveal definite preference. But, adopting the weak-ordering approach, committing ourselves to some degree of continuity (justified by the divisibility of money or general buying power), we must make two additional basic assumptions "to get any farther": that the consumer will always prefer a larger amount of money to a smaller amount and that his preference order is transitive. Hicks has no objections to these assumptions, and I have none either.

From the logic of weak ordering and the two additional assumptions just stated all major propositions of the theory of consumer's demand can be deduced. Hicks proceeds to do this first for the demand for a single commodity, that is, for the behavior of a consumer "confronted with a market in which the price of no more than one good is liable to change" (p. 47). The primary task is to derive the law of demand, that is, "the principle that the demand curve for a commodity is downward sloping" (p. 59). The technique chosen is that "of dividing the effects of a price-change into two parts": income effect and substitution effect. The latter "can be deduced from consistency theory." The income effect, according to Hicks, rests on observation; but he might just as well have said that it rests on the definitions of "normal" and "inferior" goods. (Observation comes in only to support the proposition that the income-elasticities of demand are nonzero for most goods, and positive if the goods are broadly defined.) The substitution effect, as Hicks demonstrates, tends to increase the consumption of a

good at a reduced price. The income effect will do the same, except for inferior goods. Hence, an exception to the law of demand—the Giffen case—can occur only when the good is inferior ("with a negative income-elasticity of significant size"), the substitution effect is small, and the proportion of income spent upon the inferior good is large (pp. 66–67).

II. *A Family of Hypothetical Income Variations*

The division of the effects of a price-change into substitution and income effects is arbitrary to the extent that the income effect is the hypothetical effect of a hypothetical change in income by an amount deemed commensurate to the price change. For separating out the two effects Hicks presents two alternative methods, neither of which corresponds to the one he presented in his earlier book. Since, to follow him, we have to manipulate three different income effects and two related concepts of consumer's surplus, a catalogue of the alternative concepts of relevant income variations and a graph showing the relevant indifference curves and budget lines will be useful. (Figure 1 uses indifference curves, which Hicks avoids in his book. There are no indifference curves in any of his 22 graphs, though there are points that are defined as representing "indifferent positions.") Since the relative magnitudes of the various hypothetical variations of income depend on whether the good whose price is reduced or increased is a normal or an inferior one, we must state what we assume: we assume the good to be normal.

Alternative Concepts of Income Variations Measuring Some Relevant Effects of Price Changes upon the Consumer

Pertaining to Price Reductions	*Pertaining to Price Increases*
The *cost difference L* [for Laspeyre] (shown as *FG* in Figure 1) equals the amount of a lump-sum *tax* which the consumer, following a reduction in the price of *X*, would have to pay in order to be able to purchase just the same quantities, and no more, of *X* and of all other goods that he purchased before the price reduction.	The *cost difference P* [for Paasche] (shown as *FJ* in Figure 1) equals the amount of a lump-sum *subsidy* which the consumer, following an increase in the price of *X*, would have to receive in order to be able to purchase just the same quantities, and no less, of *X* and of all other goods that he purchased before the price increase.
The *compensating income variation* (shown as *FH* in Figure 1) equals the amount of a lump-sum *tax* which the consumer, after a reduction in the price of *X* has caused him to purchase a larger quantity of *X* at the lower price, would have to pay in order to be pushed back to the same indifference level that he had attained when he purchased a smaller quantity of *X* at the higher price—provided that he is permitted after paying the tax to adjust again (reduce by *B'C'*) the quantity of *X* purchased.	The *compensating income variation* (shown as *FI* in Figure 1) equals the amount of a lump-sum *subsidy* which the consumer, after an increase in the price of *X* has caused him to purchase a smaller quantity of *X* at the higher price, would have to receive in order to be lifted back to the same indifference level that he had attained when he purchased a larger quantity of *X* at the lower price—provided that he is permitted after receiving the subsidy to adjust again (increase by *A'E'*) the quantity of *X* purchased.

The *compensating consumer's surplus* (shown as *FS* in Figure 1) equals the amount of a lump-sum *tax* which the consumer, after a reduction in the price of *X* has caused him to purchase a larger quantity of *X* at the lower price, would have to pay in order to be pushed back to the same indifference level that he had attained when he purchased a smaller quantity of *X* at the higher price—provided that he is *not* permitted after paying the tax to adjust again (reduce) the quantity (*OB'*) of *X* purchased.

The *compensating consumer's surplus* (shown as *FT* in Figure 1) equals the amount of a lump-sum *subsidy* which the consumer, after an increase in the price of *X* has caused him to purchase a smaller quantity of *X* at the higher price, would have to receive in order to be lifted back to the same indifference level that he had attained when he purchased a larger quantity of *X* at the lower price—provided that he is *not* permitted after receiving the subsidy to adjust again (increase) the quantity (*OA'*) of *X* purchased

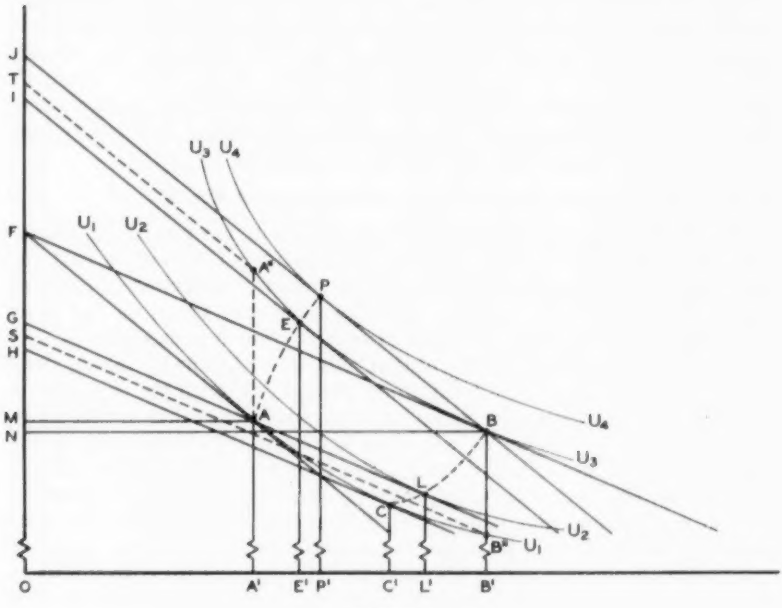

FIGURE 1

The *equivalent income variation* (shown as *FI* in Figure 1) equals the amount of a lump-sum *subsidy* which the consumer, after purchasing a certain quantity of *X* at a given price, would have to receive in order to be lifted up to the same indifference level that he would attain if a reduction in the price of *X* caused him to purchase a larger quantity of *X* at the lower price—provided that he is permitted after receiving the subsidy to adjust (increase by *A'E'*) the quantity of *X* purchased.

The *equivalent income variation* (shown as *FH* in Figure 1) equals the amount of a lump-sum *tax* which the consumer, after purchasing a certain quantity of *X* at a given price, would have to pay in order to be pushed down to the same indifference level that he would attain if an increase in the price of *X* caused him to purchase a smaller quantity of *X* at the higher price—provided that he is permitted after paying the tax to adjust (reduce by *B'C'*) the quantity of *X* purchased.

The *equivalent consumer's surplus* (shown as FT in Figure 1) equals the amount of a lump-sum *subsidy* which the consumer, after purchasing a certain quantity of X at a given price, would have to receive in order to be lifted up to the same indifference level that he would attain if a reduction in the price of X caused him to purchase a larger quantity of X at the lower price—provided that he is *not* permitted after receiving the subsidy to adjust (increase) the quantity (OA') of X purchased.

The *equivalent consumer's surplus* (shown as FS in Figure 1) equals the amount of a lump-sum *tax* which the consumer, after purchasing a certain quantity of X at a given price, would have to pay in order to be pushed down to the same indifference level that he would attain if an increase in the price of X caused him to purchase a smaller quantity of X at the higher price—provided that he is *not* permitted after paying the tax to adjust (reduce) the quantity (OB') of X purchased.

We have here five different income variations relevant to price reductions, and five relevant to price increases; since four of the latter have counterparts among the former of equal size (though of opposite signs) we have six different magnitudes. Let us defer the discussion of the four consumer's surpluses—of two sizes—and deal first with the three pairs of income variations called "cost differences," "compensating variations," and "equivalent variations." (All these terms are of Hicksian coinage.)

A. *The Three Pairs of Income Effects and Substitution Effects*

First of all, why, for the case of a price reduction, are two of the income variations visualized as taxes and one as a subsidy? The point is that the imaginary subsidy is to be given *instead* of the price reduction—hence, an "*equivalent* variation of income." The two imaginary taxes, on the other hand, are to be imposed, *after* the price reduction becomes effective, in order to undo some of the effects of that reduction, the one by taking away enought to offset the gain in total utility obtained through the price reduction—hence, a "*compensating* variation of income"—the other to take away enough to offset the money saving made in buying the old quantity at the reduced price—hence a "*cost difference à la Laspeyre*."[3] The relative sizes of the three income variations should now be clear (for the case of a price reduction of a normal good). The cost difference is the smallest; the compensating variation must be bigger in order to offset the gain the consumer could make through adjusting his purchases after paying the cost-difference tax; the equivalent variation must be bigger still because no price reduction and no substitution have yet taken place.

The income effect of a price reduction of a "normal" good is, of course, positive. How then can imaginary taxes, or income reductions, describe it? The trick is that the imaginary taxes are to be thought of as immediately followed by imaginary tax refunds, and these refunds are regarded as the income effect. First we tax the consumer (thus eliminating the income

[3] Since the latter tax would seize only what the consumer could save if he purchased the old collection of goods, and would thus leave it open to him still to improve his position (by substituting more of the cheapened good for other goods), it was once referred to as an "*undercompensating* variation of income." See P. A. Samuelson, "Consumption Theorems in Terms of Overcompensation rather than Indifference Comparisons," *Economica*, Feb. 1953, N.S. XX, 1-9.—Samuelson discussed a price increase and, hence, an "overcompensating" variation of income, since the Paasche cost difference would be larger than the compensating variation.

effect) and see how he would adjust his purchases to the price reduction—the substitution effect in isolation—and then we refund the tax to see how he would spend this increase in income. The order is reversed when the equivalent variation is used: we first eliminate the substitution effect and, by giving the consumer a subsidy and watching him adjust his consumption to it, we isolate the income effect; then we take the difference between this subsidized consumption level and the one induced by the uncompensated price reduction as the substitution effect.[4]

The three methods trace three different paths from position A to position B (see Figure 1). The equivalent variation sends us *via* E, the compensating variation *via* C, and the cost difference *via* L. Students of Hicks' *Value and Capital* may remember that they were told to take the E-route.[5] In my review article of 1940 I proposed the L-route.[6] Strangely enough, Hicks forgot both my directions and his own. He now (p. 61) attributes the L-route to a 1953 article by Samuelson,[7] and states that he himself had adopted the C-route.[8] He recommends the C and L routes as alternatives, though he finds the C-route less convenient in relation to the income effect and more convenient in relation to the substitution effect (p. 69). The E-route, once the only one described in this context, he now finds least convenient (p. 80).

The effect of the price reduction upon the consumption of X is invariably $A'B'$, but with the different imaginary intermediate points the substitution effects are $A'C'$, $A'L'$, or $E'B'$, respectively, and the respective income effects are $C'B'$, $L'B'$, or $A'E'$. If we reverse the direction of change and describe the effects of a price increase, we see that the equivalent variation will be found through C as the intermediary point, and the compensating variation through E, while the cost difference, now *à la Paasche*, will have a new point, P, as a half-way place. The relative sizes of the income variations are rather different from what they were before: the equivalent variation is now the smallest, the compensating variation is bigger, and the cost difference is the biggest (this time deserving the Samuelson designation as "overcompensating" variation). The substitution effects upon the consumption of X will now be $B'E'$, $B'P'$, or $C'A'$, the income effects $E'A'$, $P'A'$, or $B'C'$.

[4] This asymmetry in procedure is apt to cause confusion regarding the signs of the income effects. It is already a little strange that we, following Hicks, speak of a positive income effect when a negative change of price causes a positive change in the consumer's real income. It may be confusion worse confounded if we, departing from Hicks but following common sense, mark imaginary taxes with negative signs, and imaginary subsidies with positive signs, and yet use both in the explanation of a "positive" income effect. Consistency is hard to restore in this matter and I can do no better than warn the reader about the deceptive signs.

[5] *Op. cit.*, p. 31.

[6] Fritz Machlup, "Professor Hicks' Statics," *Quart. Jour. Econ.*, Feb. 1940, LIV, 280-82.

[7] See footnote 3, above. Samuelson informs me that the method was already used in Slutsky's article, "Sulla teoria del bilancio del consumatore," *Giorn. d. Econ.*, July 1915, LI, 1-26, was then repeatedly described in the index-number literature, and was alluded to by Hicks himself in the Mathematical Appendix to *Value and Capital*, p. 309. An English translation of Slutsky's article is available in *Readings in Price Theory*, G. J. Stigler and K. E. Boulding, ed. (Homewood, 1952).

[8] Hicks probably thinks of his exposition of consumer's surplus, for which he had used the C-method.

B. *The Four Consumer's Surpluses*

In *Value and Capital* the compensating variation in income figured as the consumer's surplus. "But this was a mistake," which Hicks corrected in his article on "The Four Consumer's Surpluses"[9] and corrects now again (p. 96). The "mistake" is easy to make and hard to clear up. There are, as Hicks now takes pains to explain, two angles from which demand theory can be viewed: one may ask either what quantities would be consumed at certain prices, or what maximum prices would be paid for certain quantities. Hicks accordingly distinguishes "price-into-quantity analysis" and "quantity-into-price analysis" (p. 83). The former is best understood by visualizing the consumer as a pure competitor in the market, free to purchase at a given price any quantity he chooses. For the other approach we have to imagine the consumer in a market where goods are rationed out to him, where he may have to pay discriminatory prices for every unit or at least for additional units of the commodity, or where he may be compelled to take certain quantities. The question what is the maximum amount of money the consumer might be willing to pay for a certain quantity can be answered only if we do not permit him to take less than that quantity at that price, as he would if he had his choice. Since consumer's surplus is the excess of this maximum over the actual price paid, its definitions have to provide for some such restraint concerning quantity purchased.

These restraining provisions were made in the descriptions of the four concepts of consumer's surplus included in our catalogue of alternative concepts. And these restraints account also for the size relations between the various income measures. The definition of the compensating consumer's surplus fixes the quantity that was chosen at the changed price and does not permit it to be adjusted when a compensating tax or subsidy reduces or raises the consumer back to the indifference level he had attained before the price change. The definition of the equivalent consumer's surplus freezes the quantity that was chosen before the price change and does not permit it to be adjusted when an equivalent subsidy or tax lifts or depresses the consumer to the indifference level he would attain as a result of the price change. Hence, in the case of a price reduction, the compensating consumer's surplus must be smaller than the compensating variation because a tax in the amount of the latter, with no quantity readjustment permitted, would reduce the consumer below the initial indifference level. (In Figure 1, if the consumer were assessed a tax of FH and were compelled to take the quantity OB', he would be worse off than initially. If he is to stay on the initial indifference level, U_1, he cannot pay more than $BB''=FS$ as a compensating-surplus tax.) Similarly, the equivalent consumer's surplus must be larger than the equivalent variation because a subsidy in the amount of the latter, with no quantity adjustment permitted, would fail to lift the consumer to the indifference level that the price reduction would afford him.

[9] J. R. Hicks, "The Four Consumer's Surpluses," *Rev. Econ. Stud.*, 1943-44, XI, 31-41. Hicks gives due credit for "discovering" the mistake to A. M. Henderson, "Consumer's Surplus and the Compensating Variation in Income," *Rev. Econ. Stud.*, 1940-41, VIII, 117-21.

(In Figure 1, if the consumer were given a subsidy of only FI and were held to a quantity of OA', he would not reach the indifference level U_3; it would take a subsidy in the amount of $AA''=FT$ to get him there.)

C. *Arithmetic and Graphical Illustrations*

The quantitative relationships expressed here in written language and shown geometrically in an indifference graph may be profitably reviewed by an arithmetic illustration—although to admit the usefulness of such simple devices takes courage in these days of high-powered mathematical techniques. Let us then assume a simple demand schedule with just two prices of a normal good; let us calculate the cost-differences L and P, and let us assign arbitrary but plausible values to the other income variations relevant to movements between these two points of the demand schedule. The demand schedule is reversible and, depending on the direction of the change, each price-quantity pair will in turn constitute the "initial position."

DEMAND SCHEDULE FOR GOOD X

Price	*Quantity*	*Amount Paid*
10¢	1000	$100.00
9¢	1150	103.50

Relevant Variations	As Price Is Reduced		As Price Is Increased	
	Dollar Amount	Fig. 1	Dollar Amount	Fig. 1
Change in expenditure for X	+3.50	MN	−3.50	MN
Cost difference of initial quantity	−10.00	FG	+11.50	FJ
Compensating income variation	−10.50	FH	+11.00	FI
Equivalent income variation	+11.00	FI	−10.50	FH
Compensating consumer's surplus	−10.25	FS	+11.25	FT
Equivalent consumer's surplus	+11.25	FT	−10.25	FS

Note: The inconsistencies in the signs are discussed on p. 125 above. The graph (Figure 1). is not drawn to correspond to the dollar amounts used in this illustration.

Yet another device will aid in exhibiting the income effects and the substitution effects "operating" upon the quantity of X consumed as a result of the reduction or increase in price. We may draw for the two prices a family of "uncompensated" demand curves, each with income as a parameter. Disregarding the four consumer's surpluses (because they are less helpful in "price-into-quantity analysis") we shall need four demand curves besides the one for the initial income Y: two for incomes after taxes, $(Y-10.00)$ and $(Y-10.50)$ and two for incomes after subsidies, $(Y+11.00)$ and $(Y+11.50)$, as shown in Figure 2. Using the above demand schedule for income Y and connecting the initial positions A (for the price reduction) and B (for the price increase) with the relevant points on the other demand curves, we can identify AC and AL as the two "compensated demand curves" for the price reduction, one after the tax to offset the utility gain,

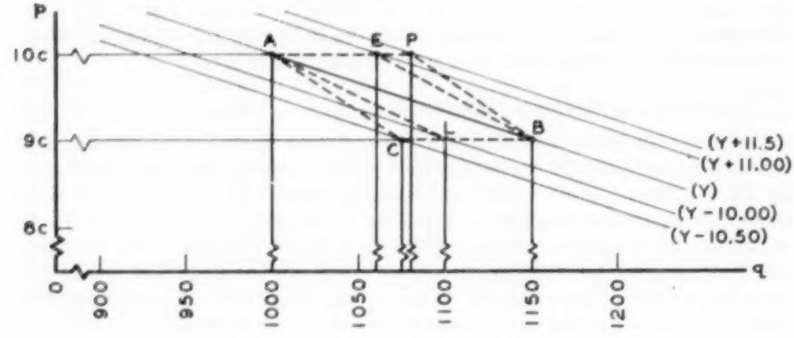

FIGURE 2

the other after the tax to offset the cost difference; and *BE* and *BP* as the two "compensated demand curves" for the price increase, one after the subsidy to offset the utility loss, the other after the subsidy to offset the cost difference.

We can again trace the effects of the price changes along alternative routes: *ACB*, *ALB*, and *AEB* for the price reduction, *BEA*, *BPA* and *BCA* for the price increase. The alternative substitution and income effects upon the consumption of *X* can be read off the graph as follows:

Cause	Route	Substitution Effect	Income Effect	Total
Price reduction from 10¢ to 9¢	*ACB*	*AC* = 75 units	*CB* = 75 units	*AB* = 150 units
	ALB	*AL* = 100 units	*LB* = 50 units	*AB* = 150 units
	AEB	*EB* = 90 units	*AE* = 60 units	*AB* = 150 units
Price increase from 9¢ to 10¢	*BEA*	*BE* = −90 units	*EA* = −60 units	*BA* = −150 units
	BPA	*BP* = −70 units	*PA* = −80 units	*BA* = −150 units
	BCA	*CA* = −75 units	*BC* = −75 units	*BA* = −150 units

D. *Marginal Valuation*

For the "quantity-into-price" approach we must become better acquainted with "marginal valuation" and the "compensated marginal valuation curve." Hicks had introduced this ingenious device in his 1944 article under the name of "marginal indifference curve." (At that time he used the term "marginal valuation curve" for a curve which is now stowed away in the attic with other old gadgets.) The new marginal valuation curve is presented together with a corresponding average valuation curve. (These curves look exactly like the well-known marginal and average product curves, with which they in fact have much in common.) The compensated marginal valuation curve is designed to show "the amounts of money which the consumer is willing to pay for successive units of the commodity *X*" pro-

vided that he "pays the full marginal valuation of each unit before making his valuation of the next" (p. 86).

What is the difference between the compensated marginal valuation curve and the compensated demand curve? The latter shows the quantities consumed at each price "under the assumption that income is continuously adjusted so as to maintain indifference of the successive positions" (p. 76). The difference is, essentially, that a marginal valuation curve may go up before it goes down, whereas the compensated demand curve can only go down. Any rising part of the marginal valuation curve will not, however, be of practical interest if the consumer can purchase as much as he wants. His demand will be "zero until price falls to his maximum average valuation" (p. 88), and at lower prices the quantities taken will be such as to secure equality between marginal valuation and price.[10]

III. *The General Theory of Demand*

After graduating from the study of "elementary" theory of demand—"in which the price of no more than one good is liable to change" (p. 47)—we advance to the study of the "general" theory—in which "more than one price-ratio is allowed to vary" (p. 107). At the outset Hicks makes us exercise with a "Second Consistency Test," only to conclude that this approach "is not promising" (p. 112). Instead, he puts us to work with so-called "indifference tests." (His penchant for giving a new name to every step in the argument leads to a bewildering proliferation of terms, which few will care to remember even if they should be able to do so.) The "first indifference test" says no more than "that as between two indifferent positions, the compensating variation C is less or equal to the cost-difference P," the Paasche cost-difference; "the second indifference test is expressed by saying that when we are comparing two indifferent positions, C must be greater or equal to L," the Laspeyre cost-difference (p. 116). These are merely new names for old ideas (which I had expressed in my 1940 article). But from these "tests" Hicks is able to deduce that the substitution effect of a price reduction must be positive (or zero, at worst). For, without income effects $P-L=S$, that is, the positive substitution effect is implied in the excess of the Paasche cost-difference over the Laspeyre cost-difference.

[10] I must briefly report on Hicks' reflections concerning the Giffen case and his discovery of an "anti-Giffen case" (p. 92). Just as the Giffen possibility rests on exceptionally strong income effects upon the *consumption* of exceptionally "strongly inferior" goods, the anti-Giffen possibility rests on exceptionally strong income effects upon the marginal *valuation* of "strongly normal" goods, possibly causing the marginal valuation curve to slope upward for another stretch. But the possibility is only of theoretical interest and of little, if any practical importance. The probability of sufficiently strong income effects is negligible, especially since what counts in practice are not single consumers, but large groups of consumers heterogeneous in tastes as well as incomes (pp. 67–68). But in addition Hicks shows that stretches of Giffen slopes would not provide equilibrium positions and would be quickly passed in swift movements of prices (or of quantities, in the anti-Giffen case). Thus, even if these unlikely situations should exist, they "would not show up," for "All that would be seen . . . would be a fall in price," and "We should not be able to tell that the law of demand was failing to operate, for the effects of that condition would be indistinguishable from the effects of a demand that was extremely inelastic" (p. 94); or especially elastic in the anti-Giffen case.

Where two or more prices change at the same time, the "Total Substitution Effect" is the sum "of the differences in quantity consumed of each good, each being valued at the corresponding difference in price" (p. 117). If price reductions are "reckoned as positive," and price increases as negative, "the total substitution effect of any price-change, however complex" must always be positive (or zero). This is christened "the First Substitution Theorem"; it contains "the downward slope of the compensated demand curve as a special case" (p. 117). To put it differently, when a compensating variation in income has made two constellations of prices and quantities equally desirable, the price reduction of X times the quantity increase of X, plus the price reduction of Y times the quantity increase of Y, plus etc., can never be negative.

From the "transitivity of indifference" follows "the additivity of compensating variations," as Hicks demonstrates in easy steps. Soon thereafter he makes the nonmathematical readers feel happy by assuring them that they have just been introduced to a statement, in economic terms, of "the fundamental theorem of Riemann integration" (p. 123). Their confidence thus being bolstered up, the readers, determined to hang on for another ride, will be glad to accept the assumption that compensated demand curves can be treated as straight lines, since "any continuous curve, over a sufficiently short stretch, is indistinguishable from a straight line (p. 125). This will take them to another vista, named "the Reciprocity Theorem."

This theorem, good for comparing three or more price-quantity constellations (with small price differences only) which are made indifferent through compensating income variations, tells us that "the sum of the quantity-changes from (0) to (1) each being valued by the price-change of the same commodity from (0) to (2), equals the sum of the quantity-changes from (0) to (2) each being valued at the corresponding price-change from (0) to (1)" (p. 126). A simple but useful implication of this theorem is that "the cross-effects of price-changes . . . are equal" (p. 127) and hence, "the relation of substitution (and complementarity) is reciprocal" (p. 128). Incidentally, discussions of complementarity are beyond the scope of elementary theory of demand because "in the two-goods case, the relation between the two goods must be that of substitution. . . . Complementarity can only occur when there are other goods outside the group of complements at whose expense the substitution in favour of the group of complements can take place" (p. 129).

Since the designation of the "first" substitution theorem has indicated that there must be more in store, my conscience forbids me to skip the "second substitution theorem." But I shall mention merely that it is chiefly concerned with a "limit on the size of the cross-effect," and provides formal support to the intuitively obvious fact that "X and Y cannot be highly substitutable for one another unless each has a demand which is highly elastic with respect to its own price." As another boon to the nonmathematical reader, I may quote an aside of the author to the effect that he finds in connection with this theorem an "example of the way in which a blind adher-

ence to standard mathematical methods sometimes produces nonsense results" (p. 134).

While we are on the subject of the cross-effects, it may be worth stressing that all references up to this point have been only to the "cross-substitution effects," isolated by means of compensating income variations. If income is not tampered with, "the equality between the cross-substitution effects may well be masked by inequality between the cross-income effects on income-elasticities" (p. 147). This was clearly set forth by Hicks in his *Value and Capital*.

A. *Exceptions to the Law of Demand*

Some other consequences of the income effect, however, are either demonstrated in novel ways or newly discovered. The chief question is whether the "Total Income Effect," which is "a combination of the separate income-effects on the separate commodities," may modify the "generalized law of demand." Hicks sees "three possible sorts of exceptions" to the law: "those due to inferior goods, to commodity asymmetry, and to asymmetrical effects of redistribution" (p. 146). The first of these exceptions is of course the "generalization of the Giffen case," in which all or most of the "price-changing goods" are inferior. Since "the share in consumer's expenditure going upon all inferior goods taken together may be much larger than that going upon any particular inferior good," a large negative income effect has a somewhat better chance of being realized where many prices may change than where only one price changes (p. 139). But it would be a very odd thing indeed if price changes in the same direction happened to be concentrated in the group of inferior goods.

The second exception is "perhaps more interesting." It is conceivable that the income-elasticities of demand for the goods that rise in price are very different from those that fall in price. Imagine sharp price reductions for a group of "necessaries (with income-elasticity zero), and a rise in the prices of a group of luxuries (with high income-elasticity)," with the gains from the price reductions exceeding the losses from the price increases. The freed income would go after the luxuries; if there is no third group of goods, and if the price ratios within the two groups have not changed, the quantities of luxuries consumed may rise despite their higher prices (p. 142). We need not expect this often, if ever, to happen in reality, but it is fun to think about it.[11]

The third exception relates not to the demand of an individual consumer but only to the market demand. In general the "probability of exceptional cases is diminished when we take a large group of heterogeneous consumers together" (p. 144). But there is the possibility of a changed distribution of a constant total income where the gainers and the losers have very different

[11] If the luxuries did not rise in price, the demand for them would surely increase by more. Thus the price increases operate in the expected, not exceptional, manner: they reduce the quantities demanded below those that would result from the price fall in necessaries. (This comment is the result of a discussion with William Fellner.)

income-elasticities of demand. Thus there is the chance of a "redistribution income-effect," and Hicks can state: "If the price of X falls (other prices constant), while the total income of consumers remains constant, it is always possible that the consumption of X may fall, if income is redistributed from X-likers to X-dislikers" (p. 145). I cannot persuade myself to see this case as an "exception" to the law of demand; the peculiar change in the distribution of income is in no way connected with the change in prices, but is just one of those things that by some queer coincidence may happen and prevent a result of another change that has occurred from being realized. The first two exceptions are due to given conditions and may occur while other things remain unchanged. The "third exception" abrogates the *ceteris paribus* clause and invokes a fortuitous change of other things.

B. *Substitutes and Complements*

The inversion of "price-into-quantity theory" to "quantity-into-price" theory, which was profitably carried out in "elementary theory," affords no less valuable insights in the general theory. What we have just learned to call the "first substitution theorem" becomes now the "generalized law of Diminishing Marginal Valuation" (p. 153). The main additions to the set of previously formulated propositions on marginal valuation concern the relationships of substitutability and complementarity, and it is on these issues that Hicks proposes some of the most significant revisions of his earlier theory. In part they represent developments of suggestions made since 1939 by Lange, Mosak, and Ichimura.

The most basic revision lies in the recognition of two alternative definitions of substitutability (complementarity), one looking toward the effect of price changes upon quantity with other prices unchanged, the other toward the effect of quantity changes upon valuation with other quantities unchanged. In order to distinguish between the two definitions, Hicks speaks of goods as "p-substitutes," "q-substitutes," "p-complements," and "q-complements." Thus, "X and Y are p-substitutes when . . . a fall in the price of X [diminishes] the demand for Y, when all *prices* save that of X are fixed, and income is adjusted so as to maintain indifference." And "X and Y are q-substitutes when a rise in the quantity of X diminishes the marginal valuation of Y (or the price at which a fixed quantity of Y would be purchased) when the *quantities* of all other commodities than X are fixed, saving the quantity of money, which is adjusted so as to maintain indifference" (p. 156).

Only in the simplest case will p-substitutability and q-substitutability be exactly equivalent, namely, in the case in which the prices of all other goods than X and Y are fixed. If other prices, say the price of Z, can vary as a result of a price change of X, there may be cross-effects upon the demand for Y which may offset the initial effect of the price change of X; indeed, the cross effect (Z upon Y) may wipe out the initial effect (X upon Y) so that "X and Y would be q-substitutes, even though they are p-complements" (p. 157). Because of such reactions through third goods the distinction between the two meanings of the relationship is necessary, although the

"reciprocity theorem holds for each of the two meanings" (p. 158).

The discussion of related goods in terms of the effects only of price changes had left a bad gap—noted in my 1940 article, identified by Lange,[12] and provisionally filled by Ichimura[13]—in that the effects of other changes, including changes in the system of wants, could not be analyzed with the tools at hand. The "sympathetic" changes in demand of which Lange had spoken in cases of what Hicks now calls "intrinsic complementarity" (p. 162) can be explained by means of the new set of concepts. It turns out that the marginal valuations of complementary goods may move in different directions while their quantities move together; and that the marginal valuations of close substitutes will move together while their quantities do not. This fits in perfectly with the old insight that "perfect substitutes tend to have constant price-ratios, perfect complements constant quantity-ratios" (p. 165).

Some of the problems of consumer's choice have been unnecessarily clouded by the practice of regarding substitutability (or complementarity) between consumer's goods always as a matter of wants or tastes even when it is a matter of technology. Hicks reminds us of Menger's distinction between "objectives" and "means of reaching" them (p. 166). Consumers may make technical decisions about alternative means of reaching their given objectives. Hence, technical substitutability (or complementarity) is relevant not only in production but also in consumption; not only in the theory of the firm but also in the theory of the household. The brief remarks which Hicks makes on this point may open up good opportunities for enterprising economists, theoretical or empirical, in search of subjects in which to invest their analytical talents.

IV. *The Importance of All That*

Many of the relationships which Hicks "discovers" or elaborates in this book are fascinating to a seasoned teacher of abstract economic theory. Does this make the book and its discoveries "important"? When I tried out some of its arguments on a more worldly economist, his reaction was "So what?". By pragmatic tests, I must admit, we shall hardly be able to claim any importance for Hicks' discoveries. They will in no way affect any recommendations of economic policy, any predictions of future events, any explanations of the past. None of our actions will be different from what it would be if this book had never been written—except perhaps the teaching of some fine points in university courses on pure economic theory (and even here most students may fail to notice the difference).

But is it fair to apply such crudely pragmatic criteria? Judged by such tests most works of art would lack importance, and so would most works in philosophy and logic. Indeed, most improvements of theoretical systems in the empirical sciences would be "unimportant," for as a rule they do not

[12] Oskar Lange, "Complementarity and Inter-relations of Shifts in Demand," *Rev. Econ. Stud.*, Oct. 1940, VIII, 58–63.

[13] S. Ichimura, "A Critical Note on the Definition of Related Goods," *Rev. Econ. Stud.*, 1950–51, XVIII, 179–83.

affect the conclusions but merely reduce the number of assumptions from which the results are deduced. The conventions of scientific methodology are quite clear on recognizing the "importance" of reconstructions in which some of the old pillars of a theoretical framework are razed.

I can understand, however, that some discontent with the rule of Occam's Razor may arise if it shaves away some very familiar assumptions and forces us to engage in brain-racking logical exercises in order to deduce our familiar conclusions from fewer (or weaker) hypotheses. This is precisely what Hicks' Revision of Demand Theory does or claims to do. Some very well-known empirical propositions (such as the law of demand) are here deduced, without the use of some very familiar assumptions (such as given systems of utility or indifference), from a smaller number of hypotheses or from less restrictive ones; and this involves heavy demands on the syllogistic agility of the readers. I can hear them say: "Why should we work so hard to obtain our results from three assumptions if we can get them with so much less effort from four or five? After all, hypotheses come quite cheap; why skimp?"

I take it that we must not give in to such lowbrow laziness. Much as we may prefer to economize in mental effort, as gentlemen and scholars we are obliged to economize in hypotheses. "A body of propositions, such as those of pure mathematics or theoretical physics [or, let us add, theoretical economics], can be deduced from a certain apparatus of initial assumptions concerning initial undefined terms. Any reduction in the number of undefined terms and unproved premises is an improvement since it diminishes the range of possible error and provides a smaller assemblage of hostages for the truth of the whole system." This, in Bertrand Russell's words,[14] is the maxim we obey; and under this maxim one may give recognition to the importance of Hicks' work even if one should not be satisfied with the contributions it makes through the theorems which are discussed in the foregoing pages. Whether Hicks' approach is an improvement not only on his earlier presentation but also on the revealed preference approach will probably be debated. The latter uses still fewer assumptions, but Hicks' assumptions are weaker (less restrictive). On different grounds some may claim that revealed preference is superior because of the "empirical meaning" of the fundamental hypothesis. For me it is sufficient that such a hypothesis be "understandable" in the light of my inner experience casually checked against like experiences of others.[15] I find superfluous the polite bows to neopositivism which the revealed preference theorists make. Whether their theory yields conclusions which Hicks' theory cannot yield is another matter, but this is not examined here.

An important book is sometimes enjoyable to read. Unfortunately this cannot be said about this book. Not that higher mathematics or complicated graphs stop the reader's progress. The exposition is nonmathematical; if there are equations and mathematical symbols on many pages of Part III,

[14] Bertrand Russell, "Philosophical Analysis," *Hibbert Jour.*, July, 1956, LIV, 321.

[15] See Fritz Machlup, "The Problem of Verification in Economics," *South. Econ. Jour.*, July 1955, XXII, 1-21, esp. pp. 16-17.

they are merely abbreviations and are not subjected to algebraic manipulations.[16] Of course, the formally literary exposition is still mathematical in the sense in which all logical reasoning is mathematical. Since the entire book is a tightly knit logical argument, it is not possible for the reader to skim the book with much chance of success; if he attempts to skip a few pages or even paragraphs he is likely to get lost. Indeed, a reader who pauses too long between chapters may have to go back and re-read lest he miss his connections. All this may explain why the book is a difficult one; but it does not explain why it gives little reading pleasure. Does perhaps Hicks' style of writing account for that? It is interesting to speculate how a master of literary exposition—rare indeed among present-day economists—might mould Hicks' material into graceful, enjoyable prose. Hicks is a very serious man and he takes his work very seriously. But could he not, metaphorically speaking, indulge in a smile once in a while? On the rare occasions when he attempts a somewhat humorous touch, the result is not always felicitous. For example, when he announces "there is a dragon waiting at the door who must first be cleared out of the way. It is the old crux of the measurability of utility" (p. 7). To be sure, we have heard of all sorts of creatures being transformed into dragons; but a dragon who is an old crux is even more forbidding than Cardinal Utility.

[16] It is disturbing, though, that Hicks uses dots where in usual practice we would find parentheses; he writes consistently $(p_0 - p_1 \cdot q_1)$ instead of $(p_0 - p_1)\, q_1$.

COMMUNICATIONS

Public Management of Private Employment Volume—A Proposal

Economics rivals philosophy in the ease with which the rash innovator can become entangled in subtle pitfalls. But the author of proposals that diverge sharply from currently accepted thought has one advantage if he is a nonprofessional, for if his schemes fall through, the danger to his personal way of life is less. I have been warned that simple answers to the problem of economic stability in a free society are not likely to be found. Quite possibly this is true. Yet it will be plain that my hopes are not small ones.

No analysis of how slumps come about will be found herein. The omission is deliberate. Rather we will seek methods of economic management having firmness enough to override ordinary causes of instability. But the firmness we seek must not notably impair flexibility or freedom in economic life.

Although the approach here is reminiscent of the Papen Plan tried in Germany in 1932 and '33, under which subsidies and concessions were granted to those employers who hired more help, the present scheme is more similar to a wage subsidy. Yet such a classification of the present proposal is inadequate, as will be seen.

I. *The Money-Pump Plan*

Let us imagine ourselves in a country where the plan is put into operation during prosperous times. The government announces that it will pay a lump sum to any employer who will contract with the government to spend at a certain minimum rate for employing people during, let us say, a year. For example, an employer of one man might agree to pay out for employment at a minimum rate of, say, $500 per quarter, which would come to $2,000 for the year. It will prove convenient to describe this employer as having acquired one "money-pump contract" or one "money pump." If he contracts to spend for employment at the rate of $1,000 per quarter, we may say that he has acquired two "money pumps." An employer of 100 men planning to pay them a total of $100,000 for steady employment during the year might acquire 200 money pumps. Thus a "money pump" or "money-pump contract" is a unit share of contracted employment responsibility—a unit-contract to spend, say, $500 per quarter for employment, but not for the benefit of specific employees. Most money pumps would be held in groups of more than one and would be separable in case of subcontracting or, to put it simply, in case of sale.

A lump-sum negative-price payment accompanies each money-pump contract when originally made or when transferred, whether paid by the government at original issue, or paid by an employer when selling his money

pumps. Except for this compensation, no new rights are granted to the holder. Stated bluntly, all that money pumps themselves do is to pump money out of the employers' pockets and into the pockets of employees. Thus their value in a free market is always negative. If the plans of our employer were curtailed unexpectedly during the year, he could subcontract some of his money-pump contracts to others, for a price; that is to say, he could sell his money pumps at the prevailing negative price, and the recipients would assume his employment responsibilities.

Since it doesn't matter who holds the money pumps so long as someone does, the government permits them to be traded at will. The market value of money pumps being negative, no certificates evidencing ownership are issued; they would be quite pointless and would be thrust down the nearest open manhole. Rather, entries in government files are the evidence of the existence of money pumps. Free private markets for transferring them spring up around regional government offices where such records are maintained.

Unlike most government contracts, the responsibility incurred would not be primarily that of the contractor to government, but rather of the contractor to a third party—the employee. Such a characteristic in a contract is somewhat unusual, but not unknown; for instance, I am told that it is not very rare for A to insure the life of B with Company C for the benefit of D. The employer might be regarded as insuring employees' jobs; the remarketing of contracts would be analogous to reinsurance.

The objective is to float a quantity of money-pump contracts sufficient to cover nearly the entire employed private labor force, thus maintaining a high level of employment and a guaranteed national annual wage. As the money-pump contracts are for definite terms, they are perpetually reissued as they expire. The expiration dates are arranged to be smoothly staggered so that the reissuing will be a continual operation.

The Negative Price. The negative price of money-pump contracts depends on the amount outstanding and on the state of business confidence. The negative price is preferably low, in order to ease the financial burden both on government in issuing them and on businessmen in subcontracting or selling them. As an educational plan to familiarize business with these new instruments, it would be possible to market short-term money-pump contracts adding up to only a fraction of actual employment. Since this operation would entail only finding *some* employers who would accept a fee for contracting to do what they aimed to do anyhow, the market would soon shake down to a token price. However, pushing up the outstanding volume of money-pump contracts to the point where they would offer a serious guarantee against mass unemployment would impose some risk on the contracting employers. Even though the risk were limited by holding down the maximum length of contract to a year from date of issue, the negative price would no doubt be appreciable. In case there were a fall in the public's propensity to spend, creating a real incentive to reduce employment below the contracted volume, the negative price would grow stiffer. This would of course mean that society (by paying more to get money pumps into cir-

culation) would be translating the avoidance of unemployment into a financial cost of government. If the scheme was fully successful, the forces tending to produce fluctuations in employment would instead only produce fluctuations in the price of money-pump contracts and in the corresponding stream of transfer payments.[1]

The demand for money-pump contracts—the desire to possess them—is always a minus quantity except at a negative price. In order to make this fact continually obvious, the horizontal axis in Figure 1 is placed at the top, even though this makes it somewhat inconvenient to speak of "rises" or "falls" in negative prices, or of "ceilings."

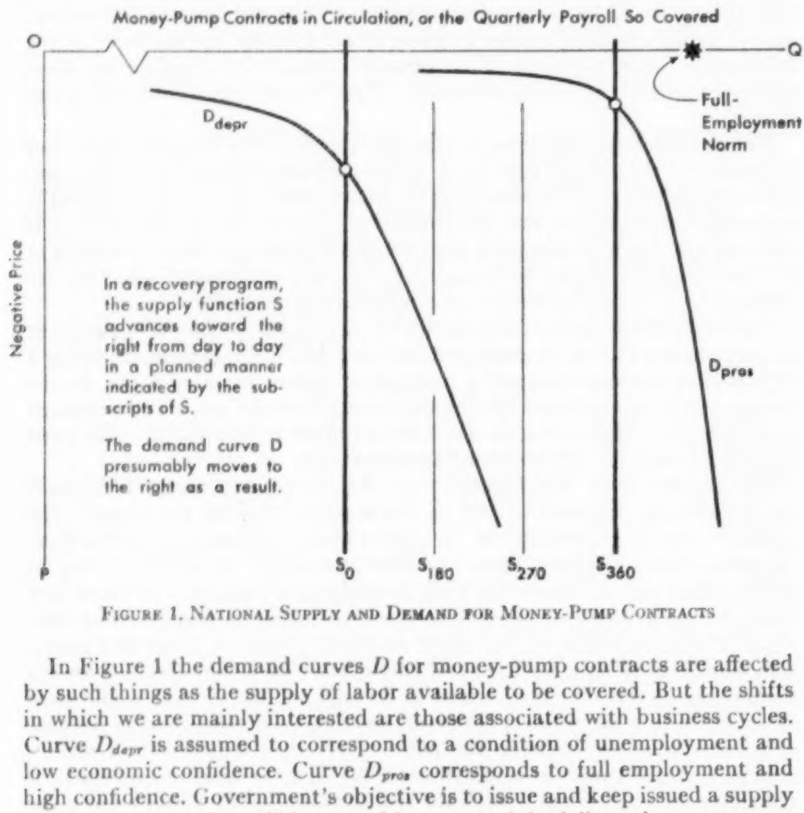

FIGURE 1. NATIONAL SUPPLY AND DEMAND FOR MONEY-PUMP CONTRACTS

In Figure 1 the demand curves D for money-pump contracts are affected by such things as the supply of labor available to be covered. But the shifts in which we are mainly interested are those associated with business cycles. Curve D_{depr} is assumed to correspond to a condition of unemployment and low economic confidence. Curve D_{pros} corresponds to full employment and high confidence. Government's objective is to issue and keep issued a supply of money pumps that will insure achievement of the full-employment norm.

[1] Two main elements of the scheme arose from consultation with A. G. Hart. The first is that of term obligations as opposed to my previous perpetual obligations. The second is that of a market mechanism for original issue, as opposed to coercive assignment of perpetual obligations. A number of observations, including the ones just made in the text, arose similarly.

The Method of Marketing. A money-pump program might be readily initiated during prosperity as a precaution against emergencies. But if a plan were put into effect during an emergency, buyers of money pumps would wish to protect themselves from capricious government action by assurance of, or even guarantee of, a vigorous government program for pushing money pumps onto the market during the term of the pumps being bought. For the purpose of recovery several types of marketing procedures may be distinguished. However, only one will be presented—the preferred form.

In Figure 1, predetermined rates of sale of money-pump contracts are rigorously maintained, the method of sale being essentially an auction. This method assumes that it is possible practically to coerce recovery, or rather to offer irresistible enticement, by allowing the negative price to reach perhaps a relatively high level at first for a short period. The supply function S for money-pump contracts at any one time is simply a rigid vertical line, indefinite in length. It is made to progress across the figure from left to right during the course of a year, more or less, come what may —slowly at first and faster later. Thus the government says to employers, in effect: "You'll buy these things at a certain speed, no matter what we have to pay you to take them." There is a special psychological value in such a program. The government can point to a graph of future employment and say, "That's the way we aim to make it happen." With a goal thus clearly defined and a plausible way to bring it about, confidence will be engendered perhaps to a high degree, helping to make the employment program a reality and preventing too severe or prolonged upswings in the negative price; or, what is the same thing, by dispelling that fear which would manifest itself by a sticky or capricious demand function.

It is unnecessary and no doubt undesirable to try to reach the full-employment goal until the plan is several months old. For instance, in fields such as custom construction and fashionable clothing, orders must precede increases in payroll. Recovery in such fields would have to lag somewhat.

An actual auction might be conducted by the government once a week in the principal financial city, during which all the week's supply of new money pumps would be sold to the low-bidding brokers and dealers present. But much the same result may be achieved by the use of written bids submitted daily. These bids would be opened every afternoon and the day's supply of money pumps would be sold accordingly. If by chance there were insufficient bids, the residue would be offered the next day. The weekly auction of Treasury bills is an analogous procedure.

For the accommodation of dealers, new money pumps would have a dormant period of, say, two weeks; that is to say, their effective period would be postdated. This interval would also serve for the formal binding of employers to their money-pump contracts.

The Quantity of Money Pumps. A legal norm for frictional unemployment has to be determined and taken into account so as to avoid the difficulties of overemployment as well as those of unemployment. A politically palatable expression of this norm might be in terms of the average number of

days out of work between jobs. The percentage of unemployment to be steered for could thus be derived.

Let us assume that the administrators of the scheme find that existing unemployment is at the legal norm for frictional unemployment and that conditions appear stable. To determine the quantity of money pumps to be put into circulation for the next period, they must still take into account anticipated changes in the privately employed labor force, including seasonal changes in so far as money pumps may be expected to help in offsetting them. The privately employed labor force is measured by the hours that the population wishes to work or, slightly more exactly for present purposes, by the payroll at existing rates that the population would prefer to earn. In setting the quantity of money pumps, the administrators (or should we call them the money pumpers?) should also allow for the price-level trend.

But the fates of individual firms and of small economic sectors and geographical areas can hardly be anticipated adequately, nor can nationwide money pumps be of much help in such problems in the short run. The residue of unpredictable and uncontrollable change is allowed for by routinely failing to issue quite enough money pumps to match the full-employment norm. In Figure 1 this gap appears as the distance between the final vertical supply function S_{360} and the star representing the full-employment norm steered for. The vertical supply function provides a "wall" against depression. But employment may of course go higher, even higher than the norm, for an employer is not compelled to hold money-pump contracts in order to employ. The vertical supply function is set at a level at which the actual employment over a period of time should average out fairly close to the full employment norm. Some experience will of course be required to accomplish this. Thus the economic ship is allowed to deviate from its course a bit with each swell, so to speak, but the average course is presumably maintained if tides and currents are compensated for.

Financing. If a money-pump program is to have the power it needs, a considerable supply of money must be on tap. If the negative price were to bump into a "ceiling," confidence in the plan would be sapped. If funds ran out, the results would be worse. Even a reasonable possibility of either of these occurrences would sap confidence in the plan and make necessary higher expenditure rates than would be required if plenty of money were known to be ready to use.

On the other hand, the receipt of much money in this way by business would hardly be politically acceptable unless the business community as a whole were ultimately to pay it back. The closer the tie-in between what business was paid and what business would later pay back, the more money could be made available to implement the money-pump program. Although I am not one to whom the corporation income tax is very attractive, business income does seem to be the only base which could furnish the potential which a money-pump program ought to have behind it. To complete the tie-in, part of the present corporation income tax might be declared an adjustable surtax, continually adjusted by a formula which would smooth

the repayments over a period of several years so that they would tend to offset the sums paid out in the long run. The negative-price payments would be received largely by the same parties who would reimburse the government out of profits later—received, that is, provided they cooperated in the money-pump program.

Under this financing arrangement, the national business community as a whole would be levying future taxes on itself according to its current acceptance of negative-price payments. But it will be clear that the acquiring of money pumps by a business would not appreciably affect national taxes on that one business, unless that business constituted a large fraction of the business community. Even in the latter case the incentive for smaller businesses to expand and to accept money pumps would remain in nearly full force, since each of these smaller firms would later pay but little of the tax revenue collectible as a result of their own accepting.

The fiscal aspect of money-pump contracts is countercyclical, since payments from government would be large only at a time of stress. Fiscal policy is a main reason for delaying the reimbursement of government by the business community. Business taxes earmarked for this purpose should be adjusted to reimburse the government over a period of up to, say, ten years. To try to square accounts between the business community and government every year or two would spoil this merit of the scheme.

Life-Span. So far we have mostly ignored the question of varying terms or life-spans of money-pump contracts. But the negative price of a contract would no doubt tend to be proportional to the term of the contract. Similarly, in cases of sale by employers the negative price would be prorated according to the unexpired term.

What is the optimum life-span for money-pump contracts? Suppose for a moment that they were all of two years' life-span. The general knowledge that the business community had contracted for an average of one year of future employment would be a powerful builder of confidence. This factor would tend to hold the negative price down. On the other hand, some employers with uncertain prospects (or with seasonal business) would hesitate to assume money-pump contracts for so long as two years, even though transferable. For a given quantity of money pumps issued, this factor would tend to raise the negative price.

Now suppose instead that an assortment of money-pump life-spans are available, all the way from three-month "bills" through one-year "certificates" up to five-year "notes." Thus the best balance of the above considerations may be obtained. One particular combination of life-spans offered for sale would presumably result in the lowest cost to the government over a long period. This combination is presumably the right one and could be approximated by the experience of the issuing agency.

For analytical purposes another quantity besides that of the negative price will prove useful. If the negative price of a money pump is divided by the total amount of the payroll disbursements contracted for by the buyer in buying it, then the quotient is a ratio (or percentage) which may be termed the "employment cost ratio." This is the cost of issuing money

pumps relative to the results produced. From the employer's point of view it is the compensation received relative to the employment burden assumed during a term. The form of Figure 1 would remain unchanged if the employment cost ratio were substituted for the negative price therein. The reciprocal of the employment cost ratio may be termed the "money-pump multiplier," for this indicates the relative efficiency of negative-price payments in maintaining employment.

II. *Problems of Administration*

Compliance. The money-pump records are kept on punched accounting cards in the regional offices of the appropriate government agency. A variety of life-spans and expiration dates are involved, and each class of money pump held by a company would presumably be represented by one card. The date of purchase is shown—also the date of sale if any, in order to prorate for those periods during which the obligation is held by another. From these master punched cards, statement-cards are prepared by machine every quarter. These are not sent out, but meanwhile every employer who files withholding-tax forms has received in the same envelope a punched accounting card with a blank space where the employer writes his sum of disbursements for employment, copied from his completed withholding-tax form. These cards are turned over to the agency administering money pumps and mechanically collated with the money-pump statement-cards, which were retained by the government. Thus one's compliance with his money pumps may be simply checked.

A penalty of 30 per cent of any unfulfilled employment obligations during a quarter is suggested. This is intended to be prohibitive under any conceivable condition. Because money pumps are acquired voluntarily and can be remarketed, they can and should be made to pump inexorably. On the other hand, hardship need not be imposed as a consequence of sudden resignation of employees or of some negligence in carrying too many money-pump contracts. Carry-over privileges may be permitted, by which small deficiencies may be made up in the next quarter. In addition, the penalty for small residual deficiencies might be set as low as 5 per cent.

What if an occasional family firm were to grant themselves high salaries in order to hold more money pumps than they were really entitled to? This loophole may be closed by denying money-pump credit to that portion of compensation in excess of, say, $2,000 paid to a person during a quarter (or $8,000 a year).

Self-Employed Persons. Should a lone proprietor or an "own-account" worker have the privilege of buying money pumps just because he employs himself? For this purpose, his earnings might be construed as a salary from himself as owner to himself as employee and thus eligible for money-pump coverage. Should not such individuals be on the same footing with enterprises of more than one man, which would be receiving negative-price payments?

The most workable approach appears to be to exclude proprietors and self-employed individuals, partners, and corporation officers both from

money-pump coverage and from the labor force as calculated for present purposes. This is within the general spirit of the scheme, which is to protect those who can hardly choose, under modern conditions, to become self-employed.

Strikes. At first thought it might be supposed that employers experiencing strikes should be permitted to sell their money-pump contracts back to the government for the duration of the strike. But this would set up the perverse incentive for some employers to incite strikes by imposing ridiculous terms on workers whom they wished to discharge during times of incipient contraction. Perhaps the most that can be done for employers directly is to allow a period of grace for negotiating sale of their money-pump contracts to other private parties. (Such lenience might be applicable to certain other emergency situations.)

The government can assure that there will be a market somewhere in the economy for such "jammed" money pumps by excluding strikers from the labor force as computed for present purposes, when they are not actively seeking other employment. This arrangement would protect employers from the otherwise crushing money-pump obligations of widespread strikes, while at the same time assuring employees that competition to employ them will remain prevalent.

Inflation. It will be clear that the general effect of the money-pump plan would hardly be deflationary. Rather it might be argued that wages would be bid up during a condition of assured full employment. Or it might happen that people would become so confident of the economic future that they would fail to save money. Would money pumps swamp us in an inflationary deluge, in the manner of the multiplied buckets of The Sorcerer's Apprentice?

We may presume that money pumps would be secure enough in their function to withstand inflation-arresting measures that would at present seem risky. Restrictive monetary measures could be applied without fear of causing another 1937. The government could show an occasional surplus as in days of yore without fear of consequences. In short, price-level policies could be pursued without at the same time threatening employment stability.

The graduated expenditure tax (or spendings tax), as analyzed most thoroughly by Nicholas Kaldor,[2] would deserve the fullest of consideration, since any deflationary tendencies of such a tax would be readily overcome. With such a tax, high rates may be levied when necessary without impairing the ability to save and invest. Such a tax can largely sterilize the inflationary effects of liquid accumulations in the hands of individuals, something the income tax cannot do. Heavy evasion might be less of a problem than with the income tax, since high spending is likely to be readily visible to all, and since the expenditure tax seems more just in that it makes important distinctions in favor of socially desirable private uses of money.

But measures involving as much change as the spendings tax probably are not essential to the reasonably smooth working of the plan. More

[2] *An Expenditure Tax* (London, 1955).

familiar fiscal measures will no doubt suffice, and the money-pump plan renders all the conventional brakes on the economy safer to use vigorously. Yet in all this it should be remembered that money pumps exert no special stimulus on the economy in good times, aside from the confidence engendered.

III. *Supplementary Devices*

Fenced Money Pumps. Preferential treatment for hard-hit geographic areas or industries might be desirable. However this should be done apart from the basic national money-pump plan. To give premiums on top of negative-price payments to, say, the capital-goods industries would necessitate compartmentizing the plan; that is to say, money pumps issued to the capital-goods industries would have to be "fenced in" there. Otherwise, all the money pumps offered would likely be bought up by capital-goods employers first, who would pocket the premiums and resell the money pumps to the rest of the economy. But this compartmentizing of the plan would put government in the position of regulating or maintaining the sizes of various industries.

Instead of premiums, additional booster-money-pump contracts might be issued to counteract local depression. The only employment which would be eligible for this money-pump credit would be that of residents of the particular areas designated. However, the negative-price payments on these fenced money pumps would be made to any employer, regardless of address. This would of course attract outside money and managers capable of providing employment. One may think of fenced, or localized, money pumps as being booster pumps coupled in series with the nationwide money pumps; a local businessman would frequently hold both and get negative-price payments with both.

Since it is impossible to completely avoid even very large variations in local employment, additional risk to employers would be incurred in purchasing fenced money pumps, even if the terms were short. Such a scheme probably could not stop a local depression from starting. But it might be able to shorten it and to reduce any need for migration. After local business was booming again (as we hope it would be), fenced money pumps ought to be discontinued for that area until needed again.

Fenced money pumps could even be issued by state and local governments. Financing could be done through taxes on those doing business locally or employing many local persons. Large disbursements during hard times could be financed through a system of loans from the national government.

In small areas it may not be practical to bring about that steady, predetermined increase in total employment which is presumed possible in large areas having many producing units and with no one of them forming a large part of the whole. Rather, a method involving a constant negative price might be more appropriate, the supply function then being a static horizontal line instead of a progressing vertical one. Thus a constant enticement would be offered to those who could provide employment. In spite

of any necessary deviations from a nationwide scheme, a trial in a limited area would no doubt be instructive.

A national plan of supplementary booster money pumps might be proposed to apply to depressed industries, in place of the above scheme applying to local areas. Which scheme is better? The local-area scheme will be better if labor mobility is less between different areas in the same industry than between different industries in the same area—as is generally probable.[3]

Excess-Reserve Permits. So far as has been explained up to now, the business community finds itself paying out large sums of money without being sure just how the money is going to find its way back. As part of the solution it must be made certain that commercial banks as a group will maintain a high level of loans and investments. But the range of conventional monetary policy can scarcely guarantee this certainty.

To meet this problem we may devise something suggestive of money pumps, namely, excess-reserve permits, which are marketable, separable, but permanent permits issued by the central bank and held by commercial banks. Each permit allows the commercial bank owning it to hold a certain quantity of excess reserves—say, $20,000. Only a limited number of the permits are issued, this number corresponding to what seems to be an adequate slack for peak excess reserves of all member banks, perhaps roughly $1 billion. Thus the program of permits limits a privilege otherwise exercisable without limit. Unlike money pumps, excess-reserve permits are not obligations to do something that involves disbursing money but rather are permits *not* to disburse money when one so chooses. Thus they have a positive market value rather than a negative one. A penalty is levied for holding excess reserves without holding a corresponding supply of permits. This would be subject to mitigating regulations in the same manner as with reserve requirements.

Excess-reserve permits constitute a general floor under bank credit but do not require any one bank to maintain a specified minimum of loans and investments, since the permits may be bought from other banks that have made loans recently. Maintaining such a floor under bank credit should be feasible if a sound general market for loans exists. The basic money-pump plan is presumed to assure that sound market. Thus the combination of the two schemes could make monetary management more of a reality than heretofore while at the same time decreasing the burden that occasionally has heaped upon monetary management.

Public Works, etc. If we presume that money pumps will assure full employment, will full employment generate enough demand to buy all that is produced? Experience suggests that within the year following an emergency initiation of a money-pump program a lag in consumption might be sizeable, depending on the state of public confidence, even though consumption would certainly be greater than before and would be rising.

Temporarily to offset any lag, reasonable increases in inventory and

[3] *Cf.* N. Kaldor, "Wage Subsidies as a Remedy for Unemployment," *Jour. Pol. Econ.*, Dec. 1936, XLIV, 721–42, esp. 727.

plant can presumably be financed with the help of excess-reserve permits. But if businessmen were to fear that such investment was rising too high, the negative price of money pumps would increase, reflecting businessmen's resistance to their continuance of full employment in the face of slack consumer demand. Yet before that happened, the government would have time to make ready a program of, say, light public works (and perhaps also one of adult education subsidies). This would permit some slackening in the number of money pumps outstanding; the government would be directly assuming the corresponding obligation.

To sum up, if money pumps assure employment, they thereby come close to assuring demand in the long run. Temporary or residual adjustments in demand presumably can be made closely enough through the use of accessory measures.

IV. *Advantages Over Similar Plans*

Wage Subsidies. Money-pump contracts might be described, in part, as a wage subsidy paid to business according to total employment provided. But if reimbursement is to be made by the business community in the long run, the name of subsidy seems inappropriate, except when speaking of individual businesses. Perhaps the term "incentive loan" is better for describing what the business community as a whole receives.[4]

There are other differences between wage subsidies as usually understood and the present scheme. A wage-subsidy scheme lacking the marketable-contract feature would have to disburse money *after* performance by employers. These disbursements would not be directly related to future employment. If an increase in the rate of subsidy were offered for the following quarter, its effect could not be measured until fresh employment statistics were accumulated. Meanwhile, the administrators could not know whether they had made the subsidy high enough or not. If they were to find that they had not, they might promise a higher subsidy rate for the remainder of the quarter, but that would complicate the administration of the subsidy. The result might be never-ceasing political demands for an increased subsidy, in order to feel sure that it was high enough.[5]

In contrast, the negative price of money-pump contracts changes itself from day to day. Thus the demand for money pumps is continuously measured and met. The rate of disbursement by government is impersonally determined by the market.

The Papen Plan. In Germany between September 1932 and April 1933, producers were paid 400 reichsmarks for each new employee hired. This was one phase of the Papen Plan, which was a failure; unemployment continued to mount. One thing to be learned from that experience is that plans which are merely static stimulants may not work. To implement fixed, one-

[4] However, see Kaldor, *loc. cit.* Much of the analysis in that paper will apply to the present scheme. *Cf.* William Vickrey, "Wage Subsidies and Unemployment," unpublished Master's thesis, Columbia University, 1937.

[5] *Cf.* A. C. Pigou, *The Economics of Welfare*, 4th ed. (London, 1932), p. 703.

time subsidies or tax allowances for hiring new employees requires arbitrary standards as to when the hiring was done and for what minimum period. Injustice between individual firms must result, depending on their recent history of hiring and laying-off. Thus such a plan cannot be made powerful enough to assure its operation without also becoming intolerably inequitable. As with some medicines, the side effects of employment subsidies necessitate weak prescriptions.[6]

If competition had been more prevalent in Germany, this phase of the Papen Plan might have been effective. As it happened, monopoly conditions generally prevented the fear that any competitors would accept the subsidy and lower their selling prices.[7] But the existence of effective competition will doubtless multiply the effectiveness of money pumps, perhaps decisively. Employers can hardly avoid acquiring them when their competitors are doing so and getting paid for it.

Hours or Dollars. The Papen Plan does suggest an alternate method of implementing the money-pump program. Could *hours* of work rather than dollars be made the criterion of compliance? Why couldn't a "pump" be rated in hours instead of dollars, obligating an employer to spend for 250 hours of employment per quarter, whatever number of dollars that would come to? There seems to be no compelling reason why either method could not be made to work.

Hour-rating of money pumps might be considered preferable to dollar-rating on the ground of the changing price level. Although corresponding adjustments could be made in the number of money pumps outstanding, perhaps the main counterargument is the presumptive ease and safety with which the price level could be controlled within an adequate program of money-pump contracts, as discussed earlier.

In favor of the dollar-rating plan, canceled checks are more convenient to verify than wage-and-hour records. On the other hand, the mass of figures currently collected by government and unions would render foolhardy any falsification of either hours worked or of sums paid. Yet I would like to think that the policing of business on such matters as wage rates and hours would ultimately be rendered obsolete under a program of money-pump contracts.

Incentive Taxes. It is instructive to apply the money-pump metaphor to other plans of this general class. In one early proposal an incentive tax was to be applied to a plant's deficiency in employment as related to its physical capacity to employ. Here the money pumps would in effect be attached to productive equipment wherever located. Other plans have proposed taxes on money or on idle money. Thus the pumps would be attached to the units of money themselves. These proposals vary as to the certainty and regularity of the resulting flow of income. They vary as to the direction of the flow induced—that is, as to whether the expenditure would immediately

[6] *Cf.* K. E. Poole, *German Financial Policies, 1932–1939* (Cambridge, Mass., 1939), pp. 40–41.

[7] *Cf.* G. Colm, "Why the Papen Plan for Economic Recovery Failed," *Social Research*, Feb. 1934, I, 83–96, esp. 90–93.

enter the flow of national income payments or dissipate itself in other ways.

In the present money-pump plan it may be said that the "pumps" are not affixed to anything, but rather are distributed about in a manner determined by individuals freely bargaining among themselves, imposing no limitations on liquidity, and granting but negligible capricious relative advantages to different firms. Thus the essential elements of control are separated from the nonessential and troublesome. The attainable result of this general approach, one may hope, would be a certainty of income flow fully compatible with flexibility and with freedom.

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Comment

Mr. Hazelett's suggestion of a control-instrument (his money pump) which would be bought and sold by private parties, and would serve as an instrument for open-market operations by public authorities, is extremely suggestive. In content, it is one of the most hopeful-looking of the long series of policy proposals designed to meet J. M. Clark's celebrated difficulty that labor cost, though an overhead for society, is a variable item for the individual employer. In form, it suggests a widely adaptable linkage of control instruments with market mechanisms.

It is very common to carry on economic-control operations by buying and selling on an existing market. But this is a proposal to create both the market and the commodity it is to deal in, so that the commodity itself becomes an instrumentality of control.

Once we look at the proposal in this way, we can see that it represents a broad class of control possibilities. Some of these are familiar as academic examples, others as bits of economic history; but something is added when we see them as a class.

To begin with academic examples, we often present in the classroom cases where use of market mechanisms might forestall the creation of certain sorts of vested interests. Grazing rights in the national forests, for example, tend to become vested, and to attach an extra element of value to property in ranches which have enjoyed such rights. Since the grazing privilege must be rationed, economists ask, should the rationing not be by price, rather than by a procedure which sets up discrimination between a favored few and excluded many? Or in a city concerned with traffic congestion, the limited number of "medallions" evidencing permission to have taxis on the streets become pieces of transferable property, with a market value exceeding that of a new cab in many cities, recognized as vested in the successors of those who had cabs when the number was closed. If such an element of value is to be created by anticongestion measures, economists ask, should

it not be captured for the city as a whole by charging for it? And (to go a step further) might not the most suitable charge be found by holding an annual auction of one-year permits?

Historically, an interesting control-instrument market has existed in recent years in the Brazilian auctions of foreign exchange with which to buy imports. Economists have noted that in cases such as the British quota on Danish bacon, a gap is opened between the British demand price and the Danish supply price, inviting dealers on one side or other of the market to form a monopolistic organization and capture the difference. If import quotas are to be limited, economists ask, why not capture this difference for society by auctioning the permits? Once a multiple-currency system is adopted, an exchange auction serves this purpose. A less obvious historical example of a control-instrumentality market is the gold standard. Genetically, of course, the gold market predated control. But in the last few decades, the "commodity" gold has evolved into a control instrument, and the market (more and more clearly centered around government operations) has adapted itself. Commodity-reserve schemes propose to create a market in a commodity-bundle of fixed composition (designed to function as a control instrument analogous to gold); their working would hinge largely on the interplay between control operations and the evolution of the bundle-market and the related markets in single commodities.

A step closer to the Hazelett type of proposal are monetary devices suggested about the time of the Korean war by Jacob Viner[1] and E. A. Goldenweiser.[2] Viner pointed out that in the evolution of our monetary institutions, reserves had changed from being a safeguard for depositors to being an instrument to control the volume of money. Since the initiative in creating or destroying money lies not in accepting deposits but in making or collecting loans, why not link reserves with loans rather than with deposits? Goldenweiser pointed out that if control was sought through a security-reserve (then a very popular suggestion), it would be more effective to require a small percentage in a special type of security issued and regulated for the purpose and held exclusively by banks, rather than a large percentage in an already-issued type largely held outside banks. Putting the two ideas together,[3] it becomes evident that aggregative control of total loans, or of total earning assets of banks, or of categories of credit otherwise defined could be attained by setting up loan-reserve requirements to be met by special securities. These securities would then become in effect transferable loan-permits, which in times of credit restriction would reflect the special value of being able to carry on the restricted activity. Such a device would socialize the windfalls from restriction (like an ideally determined excise on restricted items in a war economy) while using market allocation machinery.

[1] See the commentary by the Federal Reserve Board in Joint Committee on the Economic Report, *Monetary Policy and the Management of the Public Debt* (Washington, 1952), pp. 482–89.

[2] *American Monetary Policy* (New York, 1951), p. 63.

[3] Some of these possibilities are worked out in my *Defense and the Dollar* (New York, 1953).

Hazelett's proposal not only dramatizes the fact that some controls can be seen as the creation of markets in control instruments. It also suggests that the one-way effectiveness of some controls might be turned into two-way effectiveness by redesign. The existing markets for control instruments, as far as I have identified them, are all restrictive devices. But Hazelett is suggesting two control devices—not only his money pumps themselves, but his permits to hold excess reserves—which would be capable of setting up incentives toward economic expansion. Perhaps monetary policy "cannot push on a string." But would it be possible to run the string around a snubbing-post, so that it could pull toward expansion in a depression?

For economic-control strategy in the broad, to set up a market in instruments of control offers a most desirable kind of feedback. Proposals for control by such techniques as excise taxes, subsidies, policy toward price discrimination, interest-rate manipulation, regulation of credit terms, all look very workable when we assume that the controllers are perfect forecasters, and all become much less likely to serve the proposed ends as soon as we allow for errors of forecasting. If a market can be created in the control-instrument, however, we have essentially a market mechanism for feeling out the level of tax or subsidy that it takes to get a specified quantitative effect. If the control is redundant, its operation will send back a signal to this effect by bringing the price to zero. If tension of the sort the control is aimed at is building up, its operation will send back a signal by pulling the price farther from zero. Thus this type of mechanism offers a control pattern that will adjust itself to the intensity needed to carry out an assigned job, and beyond that is capable of registering some of the pressures against which (or with which) policy must work.

Interest in this family of control possibilities is bound to vary with our faith or skepticism about the merits of regulating components of economic activity. From the standpoint of dyed-in-the-wool interventionists, here is a choice collection of possible methods of handling components that are refractory to available controls. From the standpoint of confirmed anti-interventionists, here is perhaps a Pandora's box of new ways to get in trouble. But even the free-market enthusiast cannot afford to look only at this aspect. In the first place, some of his own proposals really call for setting up markets in control instruments.[4] In the second place, there will always be situations where the free-market purist has lost the battle as to *whether* a component should be controlled and yet may have some chance of influencing the way it is controlled; the greater impersonality and automaticity of the control-instrument-market technique as against most alternatives should then recommend it. In the third place, the free-market enthusiast in the Henry Simons tradition recognizes the need for monetary and fiscal

[4] The proposal that defense planning should rely on free markets to do the jobs assigned during the second world war to priorities and allocations is a notable example. "Priority" is a temporal concept. If there were in fact two interlinked steel markets—one in tons of steel and another in delivery dates—the proposal might be workable. But the normal market has no machinery for reallocating delivery dates as among customers. In a mild emergency "gray markets" may take over this role; but the market would not have the right kind of flexibility for a real war emergency unless dealings in delivery dates were systematized.

stabilizers. While he may well object to the ramification of sector controls of this or any other type, he should not overlook the possibility that the Hazelett technique, with its direct applicability to money flows, might be transformable into a general monetary scheme of maximum breadth and impersonality.[5]

While he has taken pains to present his proposal as a possible additional tool in stabilization policy, rather than as an all-sufficient stabilizer, Hazelett seems to me too casual about the interplay of stabilization measures. If his scheme were adopted, the need for other measures might be less reduced than he suggests; but the conditions for their application might be more improved than he suggests.

Serious as the problem might prove, I pass over the question how the scheme would work in the face of a chronic "cost-push"—that is, a tendency for wage rates to outpace productivity and push up the price level. I have not been able to satisfy myself as to how the cost-push would develop under his policy suggestions. But since this difficulty is common to almost all discussions of stabilization strategy, Hazelett's proposal can be put reasonably well in context by discussing it on the assumption that the cost-push is kept under control through labor policy (private or public).

On this optimistic assumption, Hazelett's scheme has one obvious shortcoming as a self-sufficient stabilizer: it can underwrite payrolls (and presumably employment and production); but, to invert Mill's famous dictum, demand for labor is not demand for output. Even though employers maintain production, employment, and payrolls, their sales may fluctuate. The forces which otherwise would have set up a fluctuation in employment and output will therefore set up a fluctuation not only in the price of money pumps but in the state of inventory. The increasing inventory-risk that would arise in case of serious "involuntary" inventory accumulation makes it likely that recessive forces might sometimes produce a really stiff "negative price" for money pumps.

The logic of the money-pump scheme requires the government to pay whatever price it must to keep enough pumps in circulation. To keep the price from going outrageously high, other policy measures must be able to relieve the inventory situation before involuntary accumulation goes too far. If we regard the money-pump mechanism as the basic defense against deflation, other measures must at least be strong enough to keep inventory from growing too much.

On the other hand, if the scheme were once well established, we would expect business to absorb the early stages of an involuntary inventory accumulation with equanimity. The forces which otherwise would quickly initiate a cumulative decline in output and employment would express themselves at first in a stiffening of the money-pump price. Those responsible for policy would thus gain time to turn around. Tax cuts to stimulate

[5] The "contracts" involved—contrary to those suggested in such schemes as Mordecai Ezekiel's *$2500 a Year* (New York, 1936)—are nondiscriminatory. They are not tailored to individuals by negotiations with officials who have discretionary powers, but offered impersonally to those who choose to buy them.

sales, notably, could be withheld till it was clear that involuntary inventory growth was appreciable, and yet come in time to keep the money-pump price from rising to outrageous heights.

A corollary, which Hazelett also draws, is that on the upswing there could be an energetic use of tight money and tight fiscal policy to insure against inflation, without inhibitions arising from the fear of setting off a downswing. If restrictive policy were overdone, the fact would register itself in a stiffening of the money-pump price, and in reports from business that sales were not rising enough to validate the existing output-inventory position. In this case, a downturn would be in the making. But, for the reasons just mentioned, there would be time to diagnose the situation and adapt monetary-fiscal policy to it before substantive damage was done. If the adaptation was overdone, furthermore, the inventories accumulated before it started would be an anti-inflationary cushion, and their depletion would again give time for a turnaround of policy.

Perhaps Hazelett's scheme is too outlandish ever to have a chance. Perhaps its loopholes are broader than they look, and its incidental ill-effects deeper. Certainly I would not be willing to testify that it was sound practical policy (in case it became of political interest) till these matters had been much more thoroughly thrashed out. Yet the argument just presented suggests that such a scheme would have huge advantages. Under almost any other stabilization strategy I have seen suggested,[6] the interplay of inventory position, business expectations and employment is capable of giving a downswing some momentum before the situation is recognized and corrected. The fear of such a result inhibits stabilization measures to check possible inflation in a period of prosperity. The ideal policy would be one so designed that we would always have at the beginning of a downswing what Keynes termed a "breathing-spell"—a period long enough for it to be possible to see clearly that activity was tending to sag, yet not so long that real damage had yet happened, or that the downswing had gathered momentum. Hazelett's proposal offers a mechanism that should make such a breathing-spell a regular feature of business peaks. If this proposal proves objectionable, who can devise an alternative proposal with the same virtue?

Albert Gailord Hart*

[6] A policy combination including a commodity-reserve currency, *if* the latter could be made workable on a broad enough base, would have the same advantages. But most students of commodity reserve feel that at best it could cope with the raw-material aspect of inventory, leaving inventory of finished products as a destabilizer.

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Automobile Taxation and Congestion

How might we make more efficient use of that increasingly scarce resource—street and parking space in nonrural communities (and perhaps even highway surface)? Traffic and parking problems directly affect almost

everyone in the country. The indirect effects are even more extensive. The costs of congestion, though defying close measurement, are undoubtedly huge. Solution must be largely a social undertaking; *i.e.*, individual families and businesses pursuing their own self-interest will not produce a result which is best for the public as a whole.

One part of the solution is to increase available street and off-street parking space. At best, however, any reasonably effective program would take many years, especially in metropolitan areas, and would be incredibly expensive (in terms of either dollars or the other things that would have to be sacrificed—housing, education, clothing, autos, etc.). Another approach, and one with conspicuous merit, is to use the pricing mechanism (such as high parking charges) to help allocate a limited supply.

Still another method seems worth considering—the graduation of annual license charges by auto length or by length and width combined. The main objective would be to induce the public to buy cars that would use less of the scarce, publicly owned resource which when used by one person is taken from others. A secondary objective would be an increased contribution to the public treasury from those choosing vehicles that use more public property. To illustrate, assuming that length alone is the basis of graduation, the annual fee might be $1 for each inch of length between 180 and 185 inches, $3 per inch between 185 and 190 inches, up to, say, $10 per inch of length exceeding 195 inches. Rates might well be less for cars already in existence when the new system became effective. An effective date of 1960 or thereabouts should give auto manufacturers time to plan for the transition.

In some states auto value might also remain a consideration in setting the fee because of ties to property taxation. However, since streets and highways are now built to carry much heavier loads than the heaviest auto, weight is outmoded as a rational basis for graduating charges for passenger autos.

Total dimensions, however, are of great significance. Length and width are of concern not only to the owner but also to others who wish to use the same joint facilities (streets), and to taxpayers who may be called upon to provide facilities for which the demand depends partly upon size of vehicle. Some of the driving of almost every motorist is in areas where he uses a very scarce resource, urban street space, for which no charge is feasible. Economizing its use is very much in the public interest. With the motivations now provided, however, individual actions do not combine to serve the public interest to best advantage. A license system providing strong inducements to use somewhat smaller autos—and exacting a much higher fee than today from those who continue to choose to use more of the scarce resource—could contribute to a solution.

If the average new auto were only a foot shorter, and if 4 million a year were destined for city use, about 800 miles of street-space equivalent would be released. Over a period to, say, 1970, the total would indeed be impressive even in relation to the new construction planned under the 1956 highway law. The gain would be without any expense to government. The only

cost would be the loss of satisfaction from the marginal foot of car sacrificed by those deciding not to pay the higher fee.

The system would be fully successful only if it induced auto manufacturers to produce shorter cars. No one state acting alone could create enough such pressure. How much cooperation would be required? Perhaps eight or ten of the most populous states acting together would exert enough influence. Another possibility is a recasting of the federal tax on new autos to produce the general effect. A shift from value, the present federal tax base, to size, without appreciable change of revenue, would seem appropriate. It would no more infringe on state sovereignty than does the federal highway program.

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BOOK REVIEWS

General Economics; Methodology

The State of the Social Sciences. Edited by LEONARD D. WHITE. (Chicago: University of Chicago Press. 1956. Pp. xi, 504. $6.00.)

This volume consists of some thirty papers read at the celebration of the twenty-fifth anniversary of the Social Science Research Building of the University of Chicago in November, 1955. Knowledge of that fact should suffice to forestall disappointment of anyone who reads too much into the title.

Although in the table of contents the papers are listed without classification, an effort toward coherence can be found in the full celebration program which is reproduced in an appendix. Roughly the first 350 pages of essays are classified under "Social Science as Science"; the remaing 125 pages are concerned with "The Role of the Social Scientist." Under the former head, the topics are, in this order: models in the social sciences, psychoanalytic thought and the social sciences, the comparative approach to the study of culture, analysis of social structure, the study of small groups, culture and personality in relation to human development, ecological and cultural aspects of urban research, industrial organization and economic growth, international aspects of economic stability, and the study of public opinion. Under each topic are listed from one to three papers.

"The Role of the Social Scientist" consists of a group of "conferences," each touching upon one or more topics: "The Social Scientist and the Civic Art: Economic Policy," comprising "The Role of Government in Promoting Economic Stability" and "The Role of Government in Promoting Economic Growth and Development"; "The Social Scientist and the Civic Art: Politics," comprising "The Social Scientist and the Administrative Art" and "The Art of Diplomatic Negotiation"; "Humanism and the Social Sciences"; "Civil Liberty"; and "The Dilemma of Specialization." Interspersed are an opening address by Frank H. Knight and various luncheon, dinner, and convocation addresses by David Riesman, Walter Lippmann, Lawrence A. Kimpton, and Louis Gottschalk.

All the papers are by authors notable in their fields, and most of them will be found individually interesting to many readers, although some are rather specialized. As a totality viewed from the standpoint of an effort to portray the state of the social sciences as a whole or of any particular social science, they suggest a less certain and less satisfactory conclusion. Even for such a purpose the collection is far from useless; but such success as is achieved does not add up to any landmark of integrative appreciation. Rather, the message emerges, first, in no small degree from the very lack of integration among the parts and, second, from a display, to an extent, of the state of thought of men about particular narrow areas of analysis

or application in which they have specialized. With regard to the second source of insight there is a considerable disparity of treatment. In only a minority of essays is an attempt made to state more or less explicitly the condition or flow of thought in the specific area. Such efforts inevitably rest upon summaries of or allusions to recent writers, and these latter are not infrequently handled as if intended for readers more versed in the special field than reasonable expectation would suggest. The special-field treatments which make an effort to describe the flow of recent thought are mainly Bernard Berelson's "The Study of Public Opinion," the essay on urban research by Philip M. Hauser and perhaps that by Everett C. Hughes, Harold D. Lasswell's "Impact of Psychoanalytic Thinking on the Social Sciences," and in a sense James C. Miller's previously published report on the general behavior systems theory which he hopes will integrate the social sciences. Most of the other narrow-field studies are largely samples of research or application.

Notably lacking is any essay dealing with the state of economics. The field "as science" is with imperfect congruity represented by two very good papers on specific problems, one by Stigler on "Industrial Organization and Economic Progress" and one by Viner on "Some International Aspects of Economic Stabilization." As exemplifying the role of the social scientist, two studies are presented on the role of government: Roy Blough on promoting economic stability and T. W. Schultz on promoting economic growth. Herbert A. Simon's thoughtful essay on "Models: Their Uses and Limitations" will be of interest to economists among others.

It was implied above that the book does not convey any great sense of basic and agonizing reappraisal. By and large, the problems of the social sciences seem to consist in the need for better method; and better method means some better application of the method of natural science—which is probably not far away. In this sense the tone of the social sciences is perhaps more confident than ever. Over specifics of application of scientific method there is some rending of garments.

An invitation to an agonizing reappraisal is present to a degree sufficient only to emphasize the general sense of confidence. Frank H. Knight, in his opening address entitled "Science, Society, and the Modes of Law," notably does not set the tone of the book. He once more specifically attacks "scientificism": the conclusion, after long recognition that inert natural objects are not like men, that men are like inert objects, mechanisms responding strictly in terms of cause and effect; the "romantic delusion" that application of scientific method to the problems of democratic society can produce marvels of prediction and control similar to those achieved in natural science; and the failure to accept the irrelevancy of natural science methods to the more crucial problem of democratic society—agreement on cultural norms. Much later in the book, Leo Strauss, in "Social Science and Humanism," speaks as if noting and supporting Knight's implied wish to orientate social science by reference to social philosophy: " . . . the only alternative to an ever more specialized, ever more aimless,

social science is a social science ruled by the legitimate queen of the social sciences—the pursuit traditionally known by the name of ethics." And his final challenge takes this form:

> Many humanistic social scientists are aware of the inadequacy of [ethical] relativism, but they hesitate to turn to what is called "absolutism." They may be said to adhere to a qualified relativism. Whether this qualified relativism has a solid basis appears to me to be the most pressing question for social science today.

It would seem moderate to wish that, should the messages of these lonely voices be relegated to the history of thought, the cause of their relegation be a more satisfying one than the mere deflection of scholarly attention by reason of the rules of strategy for obtaining foundation grants.

CLARENCE E. PHILBROOK

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Mensch und Wirtschaft. By OTTO VON ZWIEDINECK-SÜDENHORST. (Berlin: Duncker & Humblot. 1955. Pp. ix, 440. DM 32,60.)

This important volume is a ***mixtum compositum***, containing a generous sample of articles and essays on a wide variety of subjects by the noted Austrian-born German economist, Professor von Zwiedineck-Südenhorst. Never one to specialize on a narrow subject, the author's articles touch on almost all the important facets of the economic mosaic. In addition to an autobiographical introduction, there are fourteen articles; they are all reprints, written between 1909 and 1953.

It is impossible to do justice in this short review to Zwiedineck-Südenhorst's achievements and to appraise every one of the papers included in this compendium. To this reviewer, the following four articles stand out as milestones in Zwiedineck-Südenhorst's professional development as an economist.

In "Income Formation as a Determinant of the Value of Money" (*Die Einkommengestaltung als Geldwert Bestimmungsgrund*), first published in 1909, Zwiedineck-Südenhorst seems to emphasize the role of the state in the evolution of money, and finds this role useful in clarifying the relationship between the value of money and income distribution. He made a considerable contribution to the theory of the value of money when he pointed out that money has a subjective exchange value. This subjective value stems from the fact that, for the individual, the value of monetary units depends on his income. On the basis of the foregoing analysis, and foreseeing the "propensity to consume" concept, Zwiedineck-Südenhorst tried to prove that changes in income result in changes in the value of money.

His "Power of the State or Economic Laws" (*Macht oder ökonomisches Gesetz*), first published in 1925, continues the researches of Böhm-Bawerk and Wieser on the relationship between the government's regulative powers and economic laws. Zwiedineck-Südenhorst is best known in the United

States for his emphasis on socio-legal factors; he is a member of the group which has attempted to study government control as a social factor distinct from economic values, and the role played by the law in limiting economics.

In "Unemployment and the Law of Shifting Income Formation" (*Die Arbeitslosigkeit und das Gesetz der zeitlichen Einkommenfolge*), Zwiedineck-Südenhorst considers that he is expressing a new concept in stating that there is a difference in time between the origin of income and the arrival on the market of the output on which this income is based. For this new principle he has a new name: "the law of shifting income formation." It is to his merit that he pointed out this important consideration in connection with boom trends.

In "Rent as a Principle and as Residual Income" (*Rentenprinzip oder Rentenstellung*), written in 1932, Zwiedineck-Südenhorst shows himself to be the champion of the trend to make the phenomenon of rent a general one. He regards even pure rent as a differential, because this economic result is obtained by subtracting costs from gross income. Therefore, according to him, the result is to be looked upon as a differential, the difference between income and costs. He concedes, however, that in such cases the residual rather than the differential character is apparent. Zwiedineck-Südenhorst definitely labels it differential income in those cases where outcome of production is greater than expected by the producer. He calls such differential income a difference within the plant, and distinguishes two subgroups; *i.e.*, rent arising from the prices of the product, and rent arising from the prices entering into cost. The former appears when the producer is able to sell under more favorable conditions than other producers; the latter occurs when there is a similar advantageous price formation in the costs of production.

These "rents," however, are no more income than is the rent of the consumer. Just as the rent of the consumer is only savings and not income, similarily Zwiedineck-Südenhorst's new categories of rent are not differential incomes, but simply savings in expenditure. The concept of differential income includes the idea that the differential should show in the comparison of various economies. "Differentials" appearing within one and the same plant do not produce differential income in the accepted economic sense of the word.

The reader cannot help admire the many-sidedness of this compendium. It contains, however, only a small fraction of Zwiedineck-Südenhorst's remarkable literary contributions. There is hardly a special field of economics which is not represented here. Few economists in our days can muster such erudition and versatility.

Economists of all nations are indeed indebted to the editors of *Mensch und Wirtschaft* for making these articles available at this time, especially since most of them are hard or impossible to obtain.

GEZA GROSSCHMID

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Price and Allocation Theory; Income and Employment Theory; Related Empirical Studies; History of Economic Thought

The Meaning and Validity of Economic Theory. By LEO ROGIN. (New York: Harper and Brothers. 1956. Pp. xvii, 697. $6.50.)

It is good to have Rogin's history of economic thought; no one—not even a still living Rogin—could write it again. Seldom has an objectivity-minded, scientific treatise been so closely tied to a particular date in history (the great depression) or to a particular social viewpoint (far-left New Deal). I do not believe that the book will be considered an important contribution to the history of economics, but it sheds an illuminating light on a branch of radical thought in America circa 1940. And although written in a stiffly formal and repetitive manner—the author did not live to revise it—it is a work of real fascination.

For Rogin, the *meaning* of a theory—the objective, significant meaning—lies in its policy implications. These implications can be of at least three sorts: (1) those explicitly drawn (whether logically or not) from the theory by its author; (2) those implicit in the theory; and (3) those which are read into the theory by contemporaries who are influential in the realm of policy. Of these classes the last is much the most important: the theory as it lives in the market place of ideas has the implications for policy that count—to the extent that the theory influences policy at all. I know of no adequate analysis of the views of a ruling theory (such as Ricardo's) as held by the men of affairs and, at a degree removed, by the men of letters, and Rogin ignores the study of this class of policy views.

If one does not study the policy implications drawn by eminent contemporaries of a theorist, then surely the theorist's own policy views are more important than those implicit in the theory. The views were actually expressed, the implicit recommendations (unless they were drawn by eminent contemporaries) were only immanent. Moreover, if a theory is at all general, it seldom has specific policy implications. From the wages-fund theory, which the classical economists generally held, one can (not must) deduce that labor unions are undesirable; from the Malthusian theory, which they also held, one can (not must) deduce that they are desirable because their gains, if held, impose no long-run costs on the remainder of the labor force. Especially it is undesirable to draw, not the logical implications of the theory for policy as that theory was understood at the time, but the implications as they appear a century later to an economist with a wholly different *Weltanschauung*.

Yet these latter implications are precisely those which Rogin studies. The subjective intent of the theorist with respect to policy is of no relevance, he claims, and only what the theory rigorously implies for policy really matters. For example,

> The foregoing interpretation does not mean to assert that Say deliberately erected his theory with the single-minded intent of justifying

> income to property. In the first place, the present volume is not concerned, except incidentally, with the subjective premises of theoretical formulation, but rather with the objective meaning of theory as contingent on its orientation to the institutional environment. (P. 214.)

Rogin identifies this objective meaning with the "public" meaning of a theory (*e.g.*, pp. 10, 468)—that is, with our "eminent contemporary" meaning. But the identification is neither documented, nor, as we shall see, credible.

In practice, Rogin almost always attributes to the author of a theory the implications that he (Rogin) draws from the theory, and supplies a corresponding purpose for the theory. I give a few examples:

> . . . it may be that for Malthus the real inadmissibility of this practice [birth control] resides in the circumstance that it would so diminish the supply of labor as to disturb the working of the institution of private property as an instrument of economic coercion essential to the production of the economic surplus. (P. 170.)

> . . . Say confronts the problem of industrial crisis and depression with the theoretical apparatus he had already erected in his orientation to other practical issues, pre-eminently the defense of the institution of private property. . . . (P. 223.)

> Abstinence is, in fact, the keynote of the theory of the later Senior. . . . It is the fulcrum to which is applied the lever of Senior's economic theory, in order to pry the populace loose from its dangerous illusions concerning the role of large incomes to ownership and private accumulation. (P. 264.)

> For, in an important sense, his [Böhm-Bawerk's] monumental work on *Kapital und Kapitalzins*, which has its acknowledged practical, social origin in the conflict between labor and capital, is ultimately dedicated to a refutation of the socialist exploitation theory. (P. 517.)

These allegations of conscious implications of, and motives for, the formulation of theories are not demonstrated, and often they are completely farfetched. Thus Rogin draws a distinction between the economic theory of Senior before and after the autumn of 1830, the division corresponding to machine riots which were held to have aroused Senior's fears of the laborers and diminished his benevolence (pp. 239, 240, 243, 248, 251, etc.). Not even a modicum of evidence is given for this alleged change of view,[1] nor for this reason for any change that might have occurred.

In the main, then, Rogin discusses policy implications that should have been drawn by the author and his contemporaries—that is, if they had also been left-wing New Dealers writing in the deepest shadow of the great depression.[2] This vantage point leads Rogin to both a remarkable distribu-

[1] The basis of this charge is that Senior had not opposed unions and paternalistic labor legislation before 1830—possibly because he had not written on them. See Marian Bowley, *Nassau Senior* (London, 1937), Part II, Ch. 1.

[2] Rogin's own position, which is not under consideration here, is most explicitly stated on pages 425–27. It is composed chiefly of a Marxist critique of capitalism and a socialist-planning version of neoclassical economics with democratic political processes. But see page 410, n. 218.

tion of emphasis and a remarkable set of deductions of policy implications of theories.

The crucial implications for policy are usually in the standard Marxian categories: private ownership (=monopoly) of the means of production (pp. 161, 167, 170, etc.), devastating cyclical fluctuations (p. 261), class struggles (pp. 105, 155–56), progressive monopolization (pp. 146, 277), extreme income inequality, poverty and exploitation (pp. 102, 214). Policy implications which do not fit well into these preassigned categories are ignored, minimized, or distorted by the author's perspective. For example, Ricardo's writings on monetary policy are completely ignored, although they are at least as closely oriented to policy as his other work, and so too is his discussion of taxation.

The derivation of implications is equally one-sided. Ricardo, "the first great economic liberal who accepted modern industrialism wholeheartedly and wanted to implement it" (p. 110), served this end by his powerful arguments for free trade in corn (p. 128). He advocated a capital levy because the taxes for debt service fell on profits, and hence discouraged economic progress (p. 142). A remarkable exponent of industrialism was Ricardo, who had scarcely any knowledge of, and little interest in, the industrial life of his Britain. He had peculiar views for a wholehearted exponent: he argued that wage incomes should not be taxed, and that manufactures should not be protected by duties. Again, for Rogin the anchor of Smith's theory was the chapter (Book II, Ch. 5 of the *Wealth of Nations*) in which he argued that capital was most productive in agriculture—this is presented as the basic weapon of his attack on mercantilism (pp. 65, 71 ff.). To all other interpreters this chapter is a small scar from verbal duels in Paris.

The relationship of theory to policy is an important aspect of *Dogmengeschichte* and one which has received less study for the post-Smithian period than it deserves. We owe appreciation to Rogin for emphasizing it. But we should study, not primarily the policy questions that now seem crucial to the particular historian, but those which seemed important to the economist at the time. It is my impression that theories were seldom devised, and seldom accepted by fellow economists, to reach definite policy positions; sometimes, indeed, the theories have led their owners to policies which no sensible man not being misled by theory could possibly entertain. Conversely and perversely, many policy corollaries of a theory were expressly spurned by their authors; for example, Marshall demonstrated that excises on necessaries entail a smaller loss of consumer surplus than excises on luxuries, and he did *not* recommend that excise taxes be imposed primarily on goods consumed by the working classes. The subtle relations between theorizing and policy attitudes are not to be disentangled with a Marxian crowbar.

The *validity* of a theory, according to Rogin, is dependent not so much upon internal coherence or explanatory value (although these are not irrelevant) as upon its congruence with the main economic and political currents of its time. "[Validity] involves judgments as to the adequacy of the

theoretical articulation in the light of its practical aim, and judgments as to the possibility of the aim being realized in given historical circumstances" (p. xv). It is not clear how, on this criterion, a valid theory is to be distinguished from a successful one. But the criterion is surely superficial: every widely held theory is successful in the sense that it has had a real, although frequently a very subtle, influence on policy. The economists of the last hundred years who have held up free trade as a goal have been unsuccessful to the extent that protectionism has been increasing, but they have been successful to the extent that protectionism has had a smaller triumph than it would have had if the economists had not been opposed to it. Even in their opposition to "successful" policies the theorists have been more influential than they would have been had they jumped upon every political bandwagon.

Two examples will serve to illustrate Rogin's use of the criteria of validity. The first is the judgment on the Physiocrats, with which I am inclined to agree:

> When, as with the physiocrats, the practical interest is dictated preeminently by the requirements of capitalist entrepreneurs in agriculture and by the fiscal requirements of a moribund state, at a time when nonagricultural capitalists were leading in economic, political, and social reconstruction and on the eve of a time when the dynamics of accumulation and productivity were to be associated primarily with the career of industry, then the value of the doctrine not only is limited for the later demands of effective policy, but is also highly qualified in its own age and in the country which gave it birth. (P. 50.)

One would have thought that by the same criteria, Ricardo's successful plea for free trade would be judged highly valid, but not so: Ricardo did not orient himself to the "strategic factor" in his society:

> In terms of the professed utilitarian perspective of the Ricardians, their strategic factor should have been, not the Corn Laws with a dubious "dribbling down" theory of the material welfare of the masses, but the unrestricted acquisitiveness of those who were in control of the means of production. (P. 153.)

And so, validity, like meaning, is judged in terms of Rogin's personal positions (as he once concedes, p. 103).

The long and interesting chapter on Marx which marks the midpoint of Rogin's book and of the period covered deserves a brief comment. In broad outline it is a sympathetic interpretation of Marx, but Rogin is critical of those elements of the theory which are designed to be revolutionary propaganda (labor theory of value, theorem on declining profits). He believes that Marx's great error was to underestimate the roles of labor combination and democracy:

> As indicated earlier in our criticism of the manner in which his theory on the whole neglects the implications of state intervention and the increasing political and economic organization of labor in expanding political democracy, his theory of wages is far less a prophecy of the future

> trend of wages than a description of the untrammeled consequences of the exercise of economic force. (P. 402.)

In terms of Rogin's own framework I think this criticism is overstated: the revolutionary and antidemocratic elements of Marx's thought possibly have been even more congruent with later developments than his more positive economic theory.

Beginning with Walras, Jevons, and Menger, Rogin's treatment undergoes a moderate change of emphasis. The meaning of a theory becomes somewhat less a matter of policy implications and more a matter of analytical content, and validity becomes more a matter of the empirical validity of the theory. To the extent that the shift occurs, it represents an abandonment of the central thesis of the volume:

> My research into the history of economic thought has tended to confirm . . . that significant new orientations in economic theory first emerge (and persist, often in a changed role) in the concealed or unconcealed guise of arguments in the realm of social reform. (P. xiv.)

But partial abandonment was inevitable: the science was becoming professional and much of its subsequent development was in response to its professional needs, not to policy problems or outside pressures. The marginal utility theory, or the general equilibrium theory, or most of Marshall's analytical contributions cannot be traced to extra-scientific influences, and Rogin no longer attempts to discuss these fundamental developments in terms of his basic plan. His failure is not novel: other historians of doctrine, such as W. C. Mitchell, who sought to relate economics to contemporary economic or social or political developments, also begin to shift ground when they reach the 1870's.

The abandonment is of course less than complete, and a few examples of Rogin's later judgments may be instructive:

> Instead of working on the problems of his own time, he [Walras] worked implicitly on those which belonged to the time of Adam Smith. In doing so he betrayed his own protagonism of a *socialisme synthétique*, . . . (P. 438.)

> In its practical orientation, Jevons' theory of capitalization appears to be adjusted to the task of allaying the "delusive" conflict between labor and capital; . . . (P. 468.)

> Why does Marshall in his *Principles* fail to develop the abundant grounds of monopoly? Why does he, instead, dwell on the inhibitions to the growth in the size of firms? Because the problems of poverty and the diffusion of material welfare are to be solved in the context of private enterprise educated to "chivalry." (P. 581.)

In the case of these later economists, however, Rogin does not ignore the large parts of their theoretical work to which he cannot attach a meaning in terms of policy implications.

Instead, he shifts his attention to their analytical characteristics and especially to their empirical reality. The main judgments are not surprising:

the theory of competition is of no relevance to the monopoly-ridden economies of their times and ours, the consumer theory supports no theorems on maximum satisfaction because it accepts the existing extreme inequality in income distribution and disregards unemployment, and so forth. The "realism" of economic life continues to be the set of clichés which dominated the radical intellectual outlook of 1940.[3]

The promulgation of heartfelt views is the duty, not merely the right, of the scholar. But there is no poorer choice for the doctrinaire scholar—who tightly grasps Eternal, Pulsing Truth—than intellectual history. All his conscientious scholarship, all his talents, his sincere and urgent desire to improve the world—and Rogin had these in ample measure—cannot help him to enter the minds of other economists: he is like an efficiency expert who wonders why all 22 men do not join in moving the football in one direction. When he embraces also the thesis that theories are—and should be—formulated for policies, and forgets that theories exercise large and often unpredicted effects even upon their authors' views of policy, he is doubly lost: he has become a self-appointed schoolmaster handing out grades to students who did not take his course, and in fact were studying a different subject.

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Trends and Cycles in Economic Activity. By WILLIAM FELLNER. (New York: Henry Holt & Co. 1956. Pp. xiv, 411. $5.00.)

The postwar extension of Keynesian concepts to problems of economic growth has been accompanied by a shift in emphasis in cycle theory from the investigation of minimum requirements for cyclical behavior towards the study of the interrelationship of cycle and trend. In this book Professor Fellner, one of the pioneers of growth theory, has carried the process to its logical conclusion: the requirements of dynamic equilibrium are placed firmly in the centre of the stage, cycles are attributed to the failure of these requirements to be satisfied, and the trend is regarded as a cycle-lowered equilibrium path. To the reviewer this general approach, and particularly Fellner's view that dynamic equilibrium is a range and not an unstable point, are highly congenial. On the other hand, important facets of his central thesis are debatable, and raise doubts about his analytical methods; while his imprecise and repetitive style and the wide range of topics he selects for discussion make it difficult to follow and evaluate the detailed elaboration of his central thesis.

The book begins with a lengthy survey of statistical methods for finding trends and cycles. The author makes rather heavy weather of Frickey's

[3] Two quotations will suggest the insularity of such views from empirical research:

"There are few serious students of history who would assert that any great improvement in the material welfare of the laboring class would have taken place without the effective organization of labor." (P. 167.)

"But there can be no doubt that the *relative wages*, the share of the workers in the national income, declines with capitalist development." (Pp. 406–07.)

link-relative method, and relies for synthesis on the methodologically dubious principle that all reasonable methods of cycle-dating should give results conforming to the popularly recognized turning points. He concludes in favor of recognizing only the National Bureau cycle, while admitting the influence of longer-run irregular rhythms on its severity. Condensed narratives of major downturns are used to highlight the main points of the subsequent theoretical analysis.

Growth theory is introduced in Part II, which starts from the familiar proposition that new investment must be increasing if past investment is to justify itself—the exposition of this crucial proposition is peculiarly tortuous and difficult—and the empirical fact that the proportion of income saved tends to long-run constancy. The problem as Fellner sees it is to explain successful growth in the past. While he allows some adjustability of the capital-output ratio, he believes that the adjustability of relative income shares and the profit-plus-interest rate is limited. Consequently, in contrast to classical theory, he finds the equilibrating process in the fact that technological and organizational improvements tend to be forthcoming on the scale required to offset diminishing returns to capital (which tends to grow faster than labor) and of the type required to permit equilibrium at rising real wages (thus avoiding "social friction").

Part III elaborates on the theoretical requirements of dynamic equilibrium. The "condition" of dynamic equilibrium is a joint one, involving both general price stability and equality of planned investment with actual savings (the two are interdependent—price stability requires appropriate spending propensities for monetary policy to influence, and ensures equality of planned with actual savings). Since the condition is subjective, it must be studied via its objective corollaries, of which three are distinguished: improvements adequate in quantity and quality to offset diminishing returns to capital without "overshooting" (reducing equilibrium real wages); gradual structural change and sufficient resource mobility; and absence of legal, institutional, and policy-conflict obstacles to proper monetary management.

Failure of the corollaries to be satisfied implies scarcities and leads to cycles, which can be described in terms of alternations in the rate of overcoming scarcities. Part IV discusses the familiar paradoxes of disequilibrium, presents various reasons for being less pessimistic than one might be about the effects of a permanent stoppage of growth, and criticizes mathematical and econometric models fairly but severely.

Part V is concerned with a variety of broader aspects of growth: preconditions for the growth process as the author conceives it are discussed—adequate initial resources, administrative unification, materialistic ideology—and the prospects for growth by "latecomers" commented on. Turning to developed economies, Fellner is concerned with the possibility that the new orientation towards economic equality and security will seriously inhibit growth processes and the survival of capitalism; on balance he is optimistic, with a major reservation about the Russian military threat.

The main theme of the book is its insistence on adequate technological

and organizational improvements as the chief requirement for successful economic growth. Fellner's exposition of the mechanism by which such improvements are induced (Ch. 8) and his use of the hypothesis in the interpretation of past trends in capital-output ratios, distributive shares, and yields on capital (Appendix to Part III) are substantial original contributions. Nevertheless, reflection on this theme prompts the suspicion that Fellner may have been led from a spurious problem to a spurious conclusion: only the acceptance of the Keynesian assumption of behavioral rigidity as the natural state of capitalist economies makes successful economic growth in the past a major miracle to be explained by special factors which must then be elevated into preconditions of successful growth. The fact that in the past improvements offset diminishing returns to capital does not prove that growth could not have proceeded satisfactorily with diminishing returns, and still less does it establish an allied theme of the author's, that capitalism and Western democracy will break down if insufficiently rapid growth is generated—a proposition so far unsubstantiated. On a narrower front, the improvements hypothesis, though it illuminates, does not explain entirely satisfactorily the cycles of experience.

A review of this length cannot do justice to the breadth of Fellner's range and the subtlety of his thought on many detailed points of theory. These qualities, unfortunately, entail a certain lack of integration and require a degree of prior knowledge of the field which make it difficult to recommend the book as an introductory volume for students. It should be added that the author has provided excellent bibliographies for each section of the argument.

HARRY G. JOHNSON

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Laissez Faire and the General-Welfare State, A Study of Conflict in American Thought, 1865–1901. By SIDNEY FINE. (Ann Arbor: University of Michigan Press. 1956. Pp. x, 468. $7.50.)

This well-written and comprehensive study endeavors to draw together in a balanced presentation the main strands of public opinion, judicial interpretation, and legislative and administrative action on the subject of the role of the state in economic life. The author, who is an historian by profession, set himself the task of stating as completely as possible the philosophy current in various professions and walks of life during the latter half of the nineteenth century both favorable and unfavorable to the policy of *laissez faire,* and of tracing the reflection of this thought in actual policy. He opens with a good introductory survey of the development of American thought from 1763 to 1865, the time when *laissez-faire* thought had its greatest vogue. The central focus of the work, however, is on the period between 1865 and 1901, during which time American opinion and policy underwent a very great change away from *laissez faire.* Throughout, the attention is very heavily placed on conceptual systems, and only lightly on the political background and economic effects of public policies.

To Mr. Fine, *laissez faire* is the doctrine of the negative state. He does recognize, however, that in theory, and especially in practice, this doctrine was compatible with a good deal of government promotion of economic affairs. He uses the term *laissez faire* in a broad sense rather than in the more limited one in which it appears frequently in the eighteenth century as a public policy designed to facilitate the more effective operation and clearing of markets. To him, therefore, *laissez faire* means primarily social and economic Darwinism, and it is no accident that he leads off with a presentation of the views of Herbert Spencer, the man who, in his opinion, most influenced American thought in the mid-nineteenth century.

The first main section of the work is devoted to a statement of the philosophical foundations of *laissez faire* in America and to the elucidation of policy in the light thereof. He gives excellent brief summaries of the views of such economists as Francis Bowen, David A. Wells, Amasa Walker, Edward Atkinson, Horace White, J. L. Laughlin, A. T. Hadley, and William G. Sumner. On the whole these philosophical outlines are well done and present a good review of the opinions of professional economists on public questions at the time. That the writer regards these men as somewhat misguided is made evident by such comment as "the bankruptcy of the laissez faire position," which he uses in discussing attitudes toward unemployment (p. 62). After dealing with the theoreticians, he turns to the philosophy of the business man as indicated by speeches, letters, and essays, but here the material is much less satisfactory. Andrew Carnegie appears as the chief figure, though possibly he is not the most typical. In this section one might well question the writer's inclusion of the struggle over the monetary standards as part of the general controversy regarding *laissez faire*. It seems to be forcing matters to regard the gold standard advocates as being primarily of the *laissez-faire* camp and the greenbackers and silver interests as representing the welfare state. To this reviewer, the monetary debate seems to have been primarily a question of technical monetary management with overtones of pressures on the part of those who would gain or lose from a changed value of the dollar. The author concludes this first section by extracts from the writings of prominent Protestant clergymen and by a review of the instances in which judges by judicial interpretation wove *laissez-faire* philosophy into the law of the land. He reaches the not surprising conclusion that both the Protestant clergy and the judiciary strongly supported *laissez faire* during its period of dominance.

The larger part of the study, 231 pages, is devoted to the subsequent attack on *laissez faire* and to the rise of concepts of social control which he regards as foundation stones of the welfare state. He starts with an account of the rise of the social gospel, primarily in the Protestant churches. Of greatest interest to economists, however, is the long chapter on "The New Political Economy." The rise of this new school he attributes mainly to the influence of the German historical economists, which reached the United States through such men as Richard T. Ely, Henry C. Adams, E. J. James, Simon M. Patten, J. B. Clark, E. R. A. Seligman, and R. Mayo-Smith. Economists may well be flattered that an historian should regard the views

of some of their number as of such great importance in the history of American thought. He gives very good brief summaries of the basis of the dissent by these writers from the classical position and of their reformist views on questions of economic policy.

Members of the American Economic Association will undoubtedly also be interested to learn that their organization was founded in 1885 as a protest against *laissez faire*, and that the founders expected that the body would take a position on public issues. This view did not long prevail, however, and he notes that about 1888 this concept of the role of the Association was abandoned in favor of that of a nonpartisan professional society. Fine concludes that the new school of reformist economists contributed importantly to welfare-state philosophy by focusing attention on measures to raise the level of consumption, by emphasizing education, health and general well-being as objectives of policy, by urging national planning, especially in connection with natural resources, and by providing a rationale for the regulation of both trusts and natural monopolies.

He follows this account of the economists' opinions with a much briefer review of the ideas of leading sociologists, political scientists, philosophists, reformers, labor leaders and socialists. There is a long and interesting parade of sketches which includes such names as Lester Ward, E. A. Ross, William James, John Dewey, and Henry George. It does, however, seem very strange that the writer does not pay more attention to responsible business opinion during this period in which the rise of large-scale business was a major phenomenon. It is by no means evident that this opinion was all for *laissez faire* and social Darwinism. Indeed, one might expect that the business class would play a large role in influencing thought and policy. Nevertheless in this long section dealing at times with quite obscure reformers there is no substantial attempt made to survey the views of business leadership. One is therefore left with the impression that the reforms were carried out primarily as the result of the writings and personal influence of a small number of academicians and popular agitators. This is hardly the full story, and it seems unlikely that the writer intended it to be such.

On the whole, however, these omissions and the criticisms that might be made seem to be quite minor. This work deserves careful study by economists in general and especially by those interested in economic history and in the history of economic thought.

JOHN G. B. HUTCHINS

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Méthode scientifique et science économique. Vol. II, *Problèmes actuels de l'analyse économique: ses approches fondamentales*. By ANDRÉ MARCHAL. (Paris: Librairie de Médicis. 1955. Pp. 314.)

Any review of this book is made difficult by the fact that it represents only the second volume of an ambitious, almost encyclopedic, effort by André Marchal, professor of political economy at the School of Law of the University of Paris (not to be confused with Jean Marchal). As a result, the title of the second volume is somewhat misleading because it is less con-

cerned with methodology than with systematology, although the former is by no means absent.

He is frank in admitting that he is trying to develop a theory "for interventionist, or *dirigiste* economic policies, now followed by all the great nations," thereby divorcing himself sharply from classical economics. He criticizes former (particularly French) theories for being too abstract, too hypothetical, too deductive, and above all microcosmic and static. "Reality knows no equilibrium, only disequilibria." Much of his study is devoted to a consideration of macroeconomics, both global and sectoral, and of dynamics in its two aspects: as a method and as a phenomenon. Underlying it is another fundamental conception, namely the replacement of the individual individual by the social individual and the resulting sociologization of economics, or perhaps the replacement of certain assumptions of individual psychology by those of social psychology. Instead of a *homo oeconomicus* he sees primarily social groups, each exhibiting a diverse form of economics behavior. He accepts the term *comportement social*, coined by the other Marchal, as one of the cornerstones of his approach.

All this is in the best French tradition, clear, logical and truly monumental, although not entirely convincing when it comes to the critical points of his mental architecture, such as the transition from and connections between microdecisions and macroquantities. He recognizes the preliminary and inconclusive character of his system in his conclusions. Taking older theories to task for producing universal and perpetually valid schemes, but schemes devoid of realistic content, he advocates "spatial and sociological differentiation" and believes general theories will have to be preceded by studies of specific societies and their segments. He finally tests, and in the last analysis rejects as universally valid, the schemes of Walras-Pareto, Marshall and Keynes. The first because it assumes an universe of micro-unities and of equals, as well as the neglect of monetary factors, Marshall because of his preoccupation with micro-equilibria. His comes closest to Keynes, but rejects the oversimplifications to which his approach frequently leads, questions its applicability to full-employment societies and more particularly its lack of real dynamism. While doubting the explicative value of Keynesianism, he pays tribute to it as being "one of the first-if not the first-general and coherent theory of planned economy (*économie dirigée*)." His own preference (p. 291) is for a scheme half-way between the Walraso-Paretian and the Keynesian approach—a theory not yet conceived either by Marchal himself or by others. Thus the reader is left somewhat suspended in midair after having followed his reasoning in all its intricacies.

Perhaps the most suggestive chapter is his search for *mobiles*, *i.e.*, dynamic factors causing changes in social systems and transitions from one economic system to another. Here too his approach is essentially empirical and eclectic. He concludes that the tendency of social as well as physical sciences is away from determinism towards "possibilism" or "probabilism." He finds that even among Marxists (he quotes Engels, Labriola, Plekhanov) pluralism and probabilism are gaining as against monism and determinism. His empirical approach leads him to the finding that the capitalist system

is compatible with several different kinds of political and juridical structures, with equality as well as extreme inequality of income, even with various types of "mental structures." As a matter of fact he comes pretty close to Schumpeter, although for different reasons, in stating that "not only is capitalism compatible with different mental structures . . . but it requires in its midst groups moved by other forces (*mobiles*) than the capitalist force," such as the civil servant, the soldier, the judge, the priest, the artist and above all the scientist. He tentatively states that the same principle may apply to socialist societies, all of whom tolerate lesser or major departures from the socialist directive and "mental structure."

In a similar context he believes that both capitalism and socialism seem to be evolving neither towards classless societies nor towards increasingly rigid and antagonistic two-class societies, but towards a variety of three-class societies, in which at a higher stage of development the new middle class tends to push back both capitalist and proletarian. He cites Sweden and the United States as glaring examples of societies where the notion of "social mosaic" has replaced the notion of a social pyramid. Having just returned from the Soviet Union the reviewer hesitates to accept Marchal's notion that in that country there are two privileged classes: the high officialdom and the *kolkhozniki*. One might just as well feel that the latter are definitely underprivileged, that the lightening of government pressures is only temporary, and that a new anti-*kolkhoz* offensive is underway in the colossal *sovkhozes* now being created in the vast spaces of Kazakhstan.

Marchal's work is based on a thorough and comprehensive knowledge of French, English, American and Swedish thought and probably represents one of the best reviews and reformulations in the field. The Swedish, and above all the work of J. Akerman, comes closest to Marchal's own predilections. Marchal's trilogy seems to indicate that France has thrown off a certain traditionalism which hampered its social scientists since the last war and that it may return to its traditional role of pathbreaker and renovator.

FRANK MUNK

Reed College

Wirtschaftswachstum und Gleichgewicht. By WILLY KRAUS. (Frankfurt am Main: Fritz Knapp Verlag. 1955. Pp. 297. DM 19,60.)

This volume is of a kind rarely published in the United States or Britain. The author does not offer any distinct contribution of his own, but he does give us an accurate and up-to-date account of the major contributions to the theory of growth (Cassel, Harrod, and Domar) and the theory of the business cycle (Wicksell, Hayek, Keynes, Hansen and others). Parts I and II of the book are devoted to such an account. Moreover, in Part III the author reviews the attempts toward a synthesis of the two fields (Frisch, Metzler, Samuelson, and Hicks). In Part IV, Kraus offers his own evaluation of the relative merits of what he calls the oscillation-model approach and the Wicksellian approach.

Of these two alternatives, the former, as exemplified by Hicks' *A Contribution to the Theory of the Trade Cycle*, is long on substance but short on

generality. The Wicksellian approach is very general but rather empty as long as we are not told exactly what hides behind the terms "money rate" and "natural rate." The compromise between substance and generality will always be with us. Either we are quite unspecific, not indicating the exact number of our variables, let alone the exact relationships between them, with the result that we get generality but are exposed to the criticism that most of the work remains to be done. Or alternatively we commit ourselves to specific hypotheses, rigorously expressed, and as a result get operationally significant models with plenty of substance, but this time are exposed to the criticism that we deal with only part of the problem or with only a very special case.

By and large, economic theory is moving swiftly in the direction of more substance and less generality. Major advances like linear programming in the theory of the firm or input-output models of general equilibrium exemplify this trend. In Kraus' field, the trend is visible in the mathematical oscillation models of the Frisch, Metzler, Samuelson or Hicks variety. Such models are ingenious, Kraus admits, and they are operationally significant: Express the behavior hypotheses and the parameters in the form of difference equations, find the roots of those difference equations, and you know the properties of the time path of the system without having to trace that time path step by step.

Yet Kraus rejects such models in favor of what he calls the Wicksellian approach. The oscillation models are rejected on the grounds that they ignore money and banking, psychology, innovations, and several other things. Here, the Wicksellian theory is found to be superior, for behind the "natural rate" we find expectations, technological change, quantitative as well as qualitative growth, etc. And behind the "money rate" we find the entire structure of interest rates, standards of credit-worthiness as well as all the institutional characteristics of the banking system. Thus everything has been taken into account!

Or has it? Kraus seems to be perfectly happy with a verbal presentation mentioning everything. But it is one thing to say that linear difference equations in a few variables with a floor and a ceiling thrown in are inadequate, quite another to be content with a vague verbal enumeration of things. Richard Goodwin, in his contribution to the essays in honor of Alvin Hansen, aptly defended his use of linear relationships by saying: "Otherwise in most cases a mathematical, and *a fortiori* a verbal, analysis of this type of problem is impossible." In its ability to keep track of the timing of events, verbal reasoning is hopelessly inferior to difference equations. It would indeed be amazing if verbal reasoning should suddenly do better as the number of things to keep track of were increased or the relationships between them were to become more complicated.

Even so, one cannot but admire the fairness and accuracy with which Kraus has described the present state of affairs in the theory of growth and fluctuations.

Hans Brems

University of Illinois

Die Periodenanalyse als Theorie der volkswirtschaftlichen Dynamik. By ERICH HOPPMANN. Volkswirtschaftliche Schriften 20. (Berlin: Duncker & Humblot. 1956. Pp. 225. DM 16,00.)

For this work, "Period Analysis as a Theory of Macroeconomic Dynamics" is a misnomer. What the author intends is something like a philosophical critique of the methodological and epistemological foundations of quantitative economics.

The bulk of the first part is concerned with the simplest aspects of the subject-matter treated in Chapter 9 of W. J. Baumol's *Economic Dynamics*. There is an example of a recursive system on page 15, but the author's very first algebraic operation (a replacement) comes out wrong; $2p^2(t-1)$ is *not* equal to $2p(t)p(t-1)$.

The next part, about the "Presuppositions of Period Analysis" and, especially, "The Basic Elements (Epistemic Means) of Period Analysis," begins with a discussion of So-Being and There-Being. Some of it is meaningful but irrelevant, some of it relevant but false. The author is particularly concerned with philosophical problems pertaining to time. He feels that " 'Periodizing' in the sense of period analysis, whereby macroeconomic exchange relations are supposed to be purely formally associated with the attribute time interval, is erroneous" (p. 39), but we never learn how this blunder could be rectified.

The epistemic path (*Erkenntnisweg*) of period analysis is the next topic. There are real lags and computed lags. "Immediately really given" are only the real lags (p. 47). If the reduction of computed lags to real lags should prove impossible, then "the computed lag would be a pure So-Being, *i.e.*, one that is engendered by thinking and exists only in consciousness. Inferences therefrom would not have validity for the real reality" (p. 47).

The section on "The Theoretical Sequences as Explanation of the Temporal Connections in Economic Event Processes" makes the point that "lags are predominantly—although with gradual differences—of heterogeneous duration" (p. 121). This causes such trouble for the fixation of a unit period that "the individual recursive sequence as deduction of temporal relatednesses has no real validity any more" (p. 139).

Finally, in "The Epistemic Value of Econometric Period Analysis," the author expounds, he thinks, the principles of induction in econometrics. From page 186 on, we find a critique of the method of least squares. It is pointed out that the technique requires the computation of means. But, according to the author, the mean is just an "*ersatz* value . . . to which cannot be attributed any subject-matter significance with regard to the statistical time series" (p. 188). Why not? Because "Only if a normal distribution of the raw data is given, does the use of the arithmetic mean make sense, does it possess material adequacy" (p. 189). Later on, the author readily agrees with the econometricians that statistics cannot verify a hypothesis. However, econometricians believe, reports the author correctly, that they can at least *falsify* a hypothesis, can have criteria for rejecting it. But this is not true, either, says the author (and he does not by any means base his opinion on one of the subtler arguments of Alfred Ayer!). To sum up, "Econ-

ometric period analysis simply does not represent an 'explanation' " (p. 211).

Throughout the book there are copious references to the respectable professional literature. It is amazing what the author has read into it, or out of it, for that matter. For instance, Oskar N. Anderson is the most-quoted statistician, but one has to read only a few pages of *any* of Anderson's writings to see that the author's approach is as un-Andersonian as can be.

I cannot criticize the economics in the book because, apart from what is derived straight from other writers, or garbled, or obliquely alluded to, there is not any economics. The book does, however, contain some philosophy. And here I see the only danger coming from the book: It might make young economics students suspect that philosophers in general are frauds and that philosophy in general consists in abusing the language. It may also lead the adult reader to believe that the philosophers the author refers to most often—Joseph (not Josef) Geyser and Erich Becher of Munich—were blundering fuddy-duddies. But Geyser (*cf., e.g., Auf dem Kampffelde der Logik*, 1926, p. 31) had methodological views more sympathetic with the econometricians than with the author, and Becher put special emphasis on the circumstance "that the naive-realistic external-world image of practical life and even more so the external-world image of science have established their value and usefulness, for explaining and predicting what we perceive, in an excellent fashion and for a very wide range" (*Einführung in die Philosophie*, 1926, p. 139). Also, whatever the merit of these schools of thought, they did not inculcate the belief that philosophizing about a field of knowledge was possible without the relevant technical competence.

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John Maynard Keynes als Psychologe. By G. SCHMÖLDERS, R. SCHRÖDER, and H. ST. SEIDENFUS. (Berlin: Duncker & Humblot. 1956. Pp. 167. DM 14.-)

This book contains three essays. An introduction by Professor Schmölders, Director of the Institute for Financial Research at the University of Cologne, on the contributions of Keynes to research in economic behavior, is followed by a study of the second author on Keynes as a psychologist. An essay by the third author on the theory of expectations constitutes the final section. The book summarizes and criticizes past writings.

Schmölders sets the tone. He refers to the "unscientific and pre-scientific psychology" of Keynes and to his "reckless disregard of methods and results of scientific psychology." Nevertheless, he speaks with appreciation of Keynes' understanding of the "decisive role of human behavior in economics" and even of his knowledge of the nature of man, evidenced especially by Keynes' recognition of the power of habit. Similar are the observations of Schröder. After a detailed account of psychological statements found in Keynes' *General Theory*, he concludes that Keynes' statements are

derived from "subjective impressions" rather than from psychological studies, and are "too crude, too general, and too incomplete" really to clarify the problems raised.

These criticisms of Keynes' psychology are based to a large extent on the writings of American psychologists, sociologists, and economists, with which the authors acquaint their German readers. For readers familiar with the American literature, the quotations from the writings of the German anthropologist, Gehlen, and of the Swiss economist, Joehr, regarding a psychological business-cycle theory, are of particular interest.

Turning to the theoretical position underlying the criticism and formulated in the third essay, we find several interesting suggestions. Three planes of investigation of expectations are clearly differentiated. The "individual psychological plane," the "sociological plane," and the "institutional plane" all contribute to an understanding of expectations. The influence of groups and institutions on the formation of uniform expectations is pointed out. Unfortunately, there is no discussion of the relation of changes in the expectations of individuals to changes in the expectations of large groups and, therefore, of the relations between the micro- and the macroeconomic analysis of expectations.

Sometimes it has been assumed that German economic thinking tends to be either formal-conceptual or historical. In these German treatises, however, specific problems of economic behavior are viewed as the central problems of economics. Yet the authors do not proceed far enough. They do not seem to appreciate the need for and the possibilities of empirical research on economic motives, attitudes, and expectations. For instance, frequent lengthy quotations from this reviewer's writings consist almost exclusively of theoretical conclusions and do not acquaint the reader with any empirical studies from which those conclusions were derived or through which hypotheses were tested.

Needless to say, critical summaries of past attempts toward an understanding of the role of psychological factors in economic behavior are useful. But what is most needed at present, in the opinion of this reviewer, are studies about the ways in which expectations influence the decisions by consumers and businessmen on spending, saving, investing, or price-setting under varying conditions. Such studies need to be carried out in several countries, and it would be most valuable if it were possible to compare an analysis of German economic behavior with that of American economic behavior. The reviewer finished reading the book in the hope that it represents an introduction to future empirical studies. He trusts that the authors, after having convinced themselves and their readers of the need for psychological orientation in economic research, will proceed to reformulate their categories and models into testable hypotheses, and take steps to test these hypotheses.

George Katona

University of Michigan

Adam Smith and the Scotland of his Day. By C. R. Fay. (New York: Cambridge University Press. 1956. Pp. vii, 174. $4.75.)

This small volume of eleven chapters, one of the Social and Economic Studies sponsored by the University of Glasgow, is a study of Adam Smith and the Scotland in which he lived and wrote. That each influenced the other is accepted knowledge by students of Smith. Professor Fay, who is himself an economic historian, underscores this fact by drawing upon economic history and by giving especial attention to the influence of certain prominent countrymen of Smith and other notable Europeans of his day on literature, science, art, law, and politics as well as economics.

In the biographical part of the book the author follows closely the works of Rae, Stewart, Alexander Carlyle and W. R. Scott to which he adds interesting and significant information gained from a re-examination of materials and from new evidence. He takes one through the familiar stages in Smith's life as a youth in Kirkcaldy, in Glasgow where he was a student and later a professor, and in the cultural center of Edinburgh where much of his best work was done. The time spent on the Continent as tutor of a young Scottish duke also gave him an insight into Physiocracy. The expansion of trade and commerce which was going on at every hand provided the practical materials which made his familiar work far superior to anything yet done. Fay's emphasis on the part played by Smith in developing political economy as a science is a significant aspect of this book.

The main contribution of the book to the folklore of Adam Smith is in the last five chapters in which Fay develops the role of certain individuals not only in the scheme of political affairs but in related areas. The influences of Adam Ferguson, John Millar, and William Blackstone on political economy and the law is emphasized. Certain influential eighteenth-century persons such as Townshend, Wedderburn, Benjamin Franklin, Strahan the publisher, Edward Gibbon, a friend and contemporary who published the first volume of his book the same year as Smith's *Wealth of Nations*, and finally the leaders in Physiocracy, Quesnay and Turgot, are treated as shaping, in greater or less degree, Adam Smith's work. Of especial interest is the influence of Benjamin Franklin and the American Revolution. These glimpses, many of which one sees in the letters that passed between these various persons and Smith, will provide the reader with many clues and insights into factors that influenced his writings.

Viewed as a whole, the book adds important documentary materials to the great body of Smithlore, but the reader may be baffled at times in attempting to relate the various materials to each other. Nevertheless, the author has succeeded in highlighting the broad and significant factors that influenced Smith in writing the *Wealth of Nations*. The book ends with an appendix which discusses the controversial issue regarding the authenticity of the familiar Muir portrait of Adam Smith.

J. F. Bell

University of Illinois

National Income—Analysis by Sector Accounts. By A. J. VANDERMEULEN and D. C. VANDERMEULEN. (Englewood Cliffs: Prentice-Hall. 1956. Pp. xv, 555. $6.95.)

This book is much better than it looks. The authors have clearly put into it the experience of some years of teaching their subject, and they have produced a highly competent and painstaking piece of work. The publishers, however, have chosen to give the book an unprepossessing format, having the tentative air of a preliminary version of the real thing, and quite out of keeping with the quality of the contents. There is also a "teacher's manual" to suggest that anyone who would adopt the text could hardly be bright enough to do his own teaching. This "manual," however, is essentially an answer book containing solutions to the exercises in the text. Since there are roughly 150 of these exercises, many of them consisting of several parts, the answer book will certainly be useful.

The textbook is divided into two parts. The first 10 chapters of Part I introduce the sector accounts for households, business, and government, and develop appropriate functional relationships to yield a period analysis of the aggregative process. Three further chapters deal with comparative statics as an alternative technique, foreign transactions, and cyclical fluctuations. Part II is concerned with financial transactions, and consists of 5 chapters in which simple balance sheets are used for 4 sectors, banking now being treated as a separate category. The fifth and last chapter introduces price changes, and extends the analysis of earlier portions of the book.

The exposition is based on numerical examples throughout, and each chapter contains numerous additional exercises that not only test the student's understanding but also bring out significant points not made elsewhere. Although a rapid turning of the pages might give the impression that mathematical formulae have been overdone, closer inspection reveals nothing likely to frighten even the timid undergraduate. The authors assume no particular background beyond an introductory course in economics, and they build judiciously on what most students get from such a course rather than on what may be in it.

Owing to the form of the exposition, this book is not well suited to occasional or supplementary use. As a basic text, however, it is adaptable to a considerable range of possibilities. Students in their second year of economics should be able to follow the argument without undue difficulty and to work many of the exercises. On the other hand, instructors can easily assign exercises that will keep students with more background profitably employed.

The authors write with unusual clarity in a style unadorned by jokes, colloquialisms, or painful efforts at either. Students who find nothing to laugh at on a first reading will find nothing to complain of on a second or even a third. I do not claim to have worked through all the exercises, but substantial sampling indicates that they have been thoroughly tested in the authors' own teaching, and that they will accomplish what they should. Footnotes have been kept to a minimum, and there are no lists of additional readings.

I have found no serious errors anywhere in the book, and should be ashamed to reproduce the few minor ones I have noticed. Altogether, this is an excellent textbook, and its appearance reflects its real quality less accurately than does its price. Any instructor teaching a course in national income analysis would do well to give this book serious consideration.

RICHARD V. CLEMENCE

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National-Income Analysis and Forecasting. By ROBERT M. BIGGS. (New York: W. W. Norton & Co. 1956. Pp. xxi, 610. $5.95.)

The intent of the author has been to design this text for "the initial course in the area of prosperity and depression." In general, Professor Biggs' treatment of the basic structure of ideas in the area of macroeconomics is quite elementary. In all fairness, much of the elementary character of the analysis derives from the very lucid style of exposition, the complete absence of mathematics, and the excellent organization of the book.

After a conventional discussion of the purposes of national income analysis, he proceeds to Part I concerning the nature and measurement of economic activity. From the standpoint of acquainting the student with the sources of income and production the treatment is quite adequate. The discussion of social accounting is not as detailed as that of Richard and Nancy Ruggles,[1] but if the emphasis of a course is on analysis rather than measurement the text is satisfactory. The only major criticism of this part of the text that might be made is that the treatment of capital theory and the productive process and the distinction between income and wealth is excessively long and too elementary for students who have had a year of elementary economics.

Part II deals with income fluctuations and contains the major portion of the analytical work. The first chapter presents a simplified model of income fluctuation which is based essentially on a combination of a Keynesian definition of autonomous investment and a Robertsonian definition of lagged saving. Fluctuation occurs because the rate of autonomous investment changes and the economy moves to a new equilibrium position via the Keynesian multiplier route. This model implicitly assumes that producers' expectations are coincident with demand or are solely dependent upon the events of the last period. Even in the following chapter dealing with income fluctuations in a complex economy it is never suggested that producers' plans might differ from either consumers' or investors' plans. The only significant deviation is still between consumers' (savers') plans and investors' plans. While the author frankly states that his picture of the economy is simplified, it would seem to be more realistic and equally clear to explain the central pattern of income fluctuations by differences between the plans of producers and buyers, and the resulting failure of realization of plans by all groups.

[1] Richard and Nancy D. Ruggles, *National Income Accounts and Income Analysis*, 2nd ed. (New York, 1956).

Following the two chapters treating the mechanism of income fluctuation are three chapters on the determinants of these fluctuations; one on consumer behavior with respect to consumption and saving; one on investment, and one on other factors such as housing, government expenditures and taxation and foreign trade.

The chapter on investment contains a discussion of widening and deepening of capital, the terms being defined as a constant ratio of capital to output and an increasing ratio respectively. However, since most investment both expands output capacity and reduces the cost per unit of output or sales dollar, the distinction between widening and deepening seems arbitrary, confusing, and unnecessary to the analysis.

The chapters on consumption and investment both contain an analysis of expectations, and in each case it is argued that expectations are an independent force determining income only in those cases where the expectations are wrong. There is, however, the possibility that the optimism might be great enough to create sufficient investment and hence income to justify the investment. Optimism would of course have to grow continuously, *vide* R. F. Harrod, Domar, Fellner and others. Biggs would have to say in this case that the optimism was simply justified by reality. But this way of putting the matter would ignore the causative role of expectations in the economic process.

There is only footnote reference to the concept of marginal efficiency of capital, and this is dismissed as being relatively unimportant to the determination of investment on the grounds that profit margins are unimportant to businessmen. It is not clear why this concept is rejected, since Biggs does not suggest that businessmen do not invest without expecting a profitable return on the investment. Moreover, since profit margins, according him, are unimportant to investment so are interest rates with which they are compared. Nor is the availability of funds of importance, since there are so many sources of funds. While in my opinion the chapter on consumer behavior is the best in the text, the chapter on investment is the least satisfactory.

This part of the text concludes with a chapter on forecasting. The author prefers a national budget approach, suggesting the forecasting of various components of gross national product independently and then aggregating them with due attention to the interrelationships between the components. The student is made aware of the difficulties involved, the availability of data, and some of the inadequacies of data.

Part III is concerned with policies for periods enjoying high levels of income. The author is disparaging of individual business or labor policies as well as government policies designed to create an altered environment for the private sector. He is also quite skeptical of monetary policies and, properly so, of built-in stabilizers. In this regard he belongs to the camp of those who feel that deliberate, discretionary fiscal policies are the only solution to maintenance of prosperity.

PHILIP W. CARTWRIGHT

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Economic History; Economic Development; National Economies

Soviet Industrial Production, 1928–1951. By DONALD R. HODGMAN. (Cambridge: Harvard University Press. 1954.* Pp. xix, 241. $5.00)

The index of Soviet industrial production presented in this study is apparently a more detailed and carefully weighted index than has thus far been constructed by students outside the USSR. Interest in an independent index of Soviet industrial growth has been strong for many years. In the preface to this study, made under the auspices of the Russian Research Center at Harvard, Alexander Gerschenkron writes: "It had been recognized for some time . . . that the official Soviet index of industrial output at 1926–27 prices contained a gross upward bias which made it a very unreliable gauge of Soviet industrial growth."

Hodgman's index, covering the 1928–1951 period, and brought forward to 1953 after completion of the study, shows substantially different results from the official Soviet index. Indexes are shown for 1928 through 1937; 1940 and 1941; and 1945 through 1953. Differences from the official index are particularly large for the 1928–1937 period. Over this period, the official Soviet index shows a growth of 450 per cent, while Hodgman's index rises 270 per cent. Hodgman's more modest measure of Soviet industrial expansion is impressive enough, implying an average rate of growth of 15 per cent per annum.

In the postwar period, from 1946 to 1953, the trend in Hodgman's index is much more like the official one, rising 192 per cent compared to 223 for the Soviet index. In the years 1950 to 1953, Hodgman's index rises 38 per cent compared with 44 per cent for the official index, indicating roughly a per annum rate of 12 per cent. In the United States, in the postwar period, industrial production has been rising at an average rate of 4 to 5 per cent per year.

Hodgman's chief contribution is in the index for the 1928–1937 period, when the coverage available to him is relatively comprehensive and the quality of the underlying series comparatively good. For this period, 137 physical product series are used covering 54 per cent of large-scale industry. Raw materials are well covered in the index, but Hodgman also has representation for a number of finished products, mainly machinery items.

The substantial departure of his index from the official index for the 1928–1937 period tends to confirm the broad findings of some earlier observers whose appraisals of Soviet industrial performance were based on much more primitive calculations. The problem of correcting for overstatement in the Soviet index contrasts with the frequent need to overcome an apparently inherent downward bias in production indexes for this country and for some abroad.

Hodgman's major task was the construction of a detailed set of weights approximating a value-added concept. These weights apparently underlie

* *Editor's note:* Neither the *Review* nor the author of this review is responsible for its belated appearance.

most of the difference from the official Soviet index. Weights in the official index were based on gross values instead of value-added. For the period prior to 1951, the prices used for weights resulted in considerable overstatement of Soviet expansion. Prices were based partly on the pre-industrialization 1926–27 period which tended to overvalue products about to undergo rapid expansion in output. In addition, prices of new products were drawn from their year of introduction and during a period of considerable inflation.

Weights in Hodgman's index are based on payrolls including payroll taxes for the year 1934. The use of payrolls to approximate value-added tends to overweight industries where labor input is high relative to total value-added, and of course underweight the others. According to U. S. data on wages and salaries in relation to value-added and to national income, industries with a relatively low labor input include chemicals, petroleum refining, and electric utilities. In the 1928–1937 period, output of Soviet electric power stations and the chemicals industry grew far more rapidly than the remainder of large-scale industry, according to Hodgman's index. Petroleum refining showed a smaller increase than the total. By contrast, the textiles and leather industries, which grew much more slowly than other industries in the Soviet Union, have a high labor input in relation to total value added. The combination of overweighting the slow-growing industries and underweighting the fast-growing ones imparts a downward bias to the total index. There are, however, many offsets, and the net effect on the total index stemming from the use of payroll weights is difficult to determine. Moreover it is not certain that United States data on the relation of payrolls to value-added are applicable to Soviet industry.

The coverage of Hodgman's index is confined to so-called "large-scale industry." Generally speaking this segment covers factories, mines, electric power stations, and fishing industries. Aside from fishing, the area covered is broadly equivalent to manufacturing, mining and utilities, for which indexes are available in the United States, Canada, Great Britain, and other countries. Small-scale industry apparently refers mainly to small flour mills and bakeries, but also to tailors, shoemakers, smithies, and the like, which actually produced a sizable volume of goods in the earlier part of the 1928–1937 period. The share in total output of small-scale industry fell rapidly during the whole period.

After 1937 the Soviet government sharply curtailed the publication of production statistics. As a result the coverage of Hodgman's index is cut more than in half, and its quality becomes quite thin for the later period. The reader is warned emphatically on page 81 as follows: " . . . the revised index must be considered provisional for the post-1937 period until such time as more ready access to detailed production data provides an opportunity to verify and supplement data presently available."

The reliability of the indexes for the earlier period, however, is also heavily qualified by Hodgman because of the many adjustments involved in the calculation of weights, in the construction of continuous series, but most important in the correction for incomplete coverage. This reviewer

cannot, of course, judge the reliability of the very large adjustment for the unrepresented industries. Approximately two-thirds of all metal-working industries are missing and are assumed to have the same quantity changes as the represented one-third. For all industries other than metal-working, approximately one-third are not directly represented and these are assumed to move with the directly represented industries in the nonmetal-working area. The adjusted index rises somewhat more than the unadjusted, because the weight of the fast-growing machinery index is increased while the weight of the relatively slower-growing nonmetal-working industries is reduced. The calculations are carefully and well documented, so that a reader knowing more about Soviet industry than this reviewer, may appraise the numerous assumptions involved.

Hodgman has put together an admittedly sketchy but useful index of output of industrial consumer goods, which brings out clearly the far more rapid prewar growth in the nonconsumer sector of the economy. From 1928 to 1937, Hodgman's index for consumer goods rises 137 per cent compared with a rise in the total index including consumer goods of 270 per cent.

In the postwar period, at least from 1946 through 1951, growth shown in the consumer-goods index tends to parallel that for the rest of the economy. This growth from 1946 in consumer goods was from greatly depressed levels. In this later period, owing to lack of data, the consumer-goods measure is based on only a few items, and doesn't include meat, milk, bread, shoes, or any items of household equipment. It is interesting to note that Hodgman's consumer-goods index shows more rise from 1946 to 1950 than the official Soviet index for consumer goods.

The index of machinery output is the most important composite in Hodgman's index. Before adjustment for coverage in the metal-working group of industries mentioned above, this index is 19 per cent of the total in 1934. After adjustment it is 32 per cent. Machinery is defined more widely than in the United States to include transportation equipment. Hodgman compares his machinery index with a more detailed special index for machinery constructed by Gerschenkron.

The differences between the two machinery indexes are rather large and for the period as a whole Hodgman's index rises much more than Gerschenkron's. The machinery index is a rough clue to the relatively rapid rate of growth of the nonconsumer sector of the Soviet economy. From 1928 to 1937, Hodgman's machinery-output index shows a rise of 525 per cent or nearly four times the increase shown in his index for consumer goods. Gerschenkron's index shows a rise in machinery output of 425 per cent.

There is a strong suggestion that Hodgman's weights may be preferred but that Gerschenkron's index has much better coverage. It is not made clear why Hodgman did not use the more detailed series developed by Gerschenkron for so important an area of the total index. Apparently he felt that superior coverage would be offset by dubious weight calculations.

It would seem to this reviewer that, generally speaking, information on important series ought not to be discarded because of lack of good data on weights. Approximate data on weights might profitably be employed. The

tendency to "lose" series data is apparent elsewhere in Hodgman's index when physical product data for the important lumbering industry are disregarded because of a lack of definite information on weights. Hodgman does, however, show as a convenience to the reader the physical product data for the lumbering industry.

A short chapter devoted to comparing rates of growth in the Soviet Union with those in other countries should be of interest to the growing number of students of economic development. While the present rates of growth in the Soviet Union are indeed very high, Hodgman anticipates some slowing down as the economy becomes more mature.

Hodgman has written a fine book on a difficult subject in economic measurement, involving more than the usual complement of data problems and in an area where broad margins of error seem unavoidable. He has undoubtedly made a big step forward in his index for the 1928–1937 period. This book, in general, is noteworthy for its full documentation of sources and description of procedures. Not many economists are willing to face the task of detailed measurement, and for those who do, and do it well, special commendation seems in order.

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* The views expressed in this review are those of the author and do not necessarily reflect those of the Board.

Mainsprings of the German Revival. By H. C. WALLICH. (New Haven: Yale University Press. 1955. Pp. xi, 401. $4.50.)

Professor Wallich's book on the German economic recovery from the middle of 1948, or the date of the currency reform, up to the end of 1954 is the first comprehensive study available in any language of this remarkable episode. It is therefore not surprising that the book was immediately translated into German, thus offering to the Germans the views of a foreign observer on their own achievements.

Wallich develops first a philosophy of economic growth by contrasting two types of economic development: one type consisting in the "production oriented" growth in which the entrepreneur and his autonomous investments play the central role, and the other in the "consumption oriented" growth, illustrated by the welfare state of the British kind. The German case belongs, according to the author, to the first category. One may doubt whether this division is a fruitful one, but, as the author's investigation of the German case is in no way affected by it, it does not detract from the value of the book even for the reader who disagrees with the distinction.

After describing the extent of the German recovery by reference to the increase in national income, its sources and its utilization, the author takes up monetary and fiscal policy, the free-market policy followed by Erhard (and the exceptions to it), investment and the sources of the funds from which it was fed, the balance of payments, the progress towards converti-

bility of the D-Mark, population movements, labor problems, and some topics of a more sociological and political character.

The picture that emerges is one of a swiftly expanding economy, in which investments and exports ran ahead faster than consumption. The expansion was made possible by the absorption of the unemployed and the influx of workers from the east, as well as by a rapid rise in productivity per head. Investments could be largely financed out of industrial profits which owed their existence partly to the restraint which labor exercised in its wage demands, and partly also to a tax system which favored investment (as well as savings). The long-term capital market was extremely narrow, largely as a result of the fixing of interest rates at 5 per cent on mortgage bonds and 6½ per cent on industrial bonds. Only late in 1952 were interest rates freed from controls. The dearth of capital led entrepreneurs to finance even long-term projects with bank credit which, in view of the limited dimensions of the securities market, could not easily be consolidated subsequently through issues on that market. However, the unprecedented expansion of bank credit did not have inflationary effects since it was in good part matched by an expansion of savings- and time-deposits.

In the field of monetary policy the central bank was, the author relates, urged by representatives of the Economic Cooperation Administration "by some elements within the British military government," by the German Social Democrats, and by the trade unions, to follow an aggressive full-employment policy *via* credit expansion. The West German government "leaned towards the conservative view" which was shared by the central bank; the latter regarded the maintenance of the stability of the purchasing power of the D-Mark as its first duty. The result was an "orthodox" monetary policy. Careful scrutiny of this policy brings the author to the conclusion that, on the whole, the policy of the central bank was the correct one. Indeed, as the unemployment in Germany was "structural" in character, the Keynesian policy of general credit expansion would not have been a cure for it.

The author rightly refrains from attributing the German recovery to a single cause; and he does not attempt, either, to weight the contributing factors according to their relative importance. This could, in any case, only be done "impressionistically." Nonetheless, it might seem to many observers, including the present reviewer, that priority ought to be assigned to the restraint exercised by labor in its wage demands. This factor was in large part responsible for the high profits and therefore for the high level of investment; it helped to make German industry competitive in the world market; and it facilitated the task of the central bank in keeping the purchasing power of money stable and thus satisfying what was a prerequisite for the revival of personal savings. Nor is this factor irrelevant, undoubtedly, to what is perhaps the most remarkable achievement of all during the period of six years which Wallich covers, namely, the absorption by the productive process of an increase in the total employed labor force of well over 20 per cent, and in the industrial labor force taken alone of some 35 per cent.

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Statistical Methods; Econometrics; Social Accounting

The Structural Interdependence of the Economy. Proceedings of an international conference on input-output analysis. Edited by TIBOR BARNA. (New York: John Wiley. Milan: A. Giuffrè, for Faculty of Economics, University of Pisa. 1956. Pp. x, 429. $7.50.)

The papers included in this book were presented at an international conference in Varenna, Italy in 1954. The purpose of this conference, with participants from Italy and ten other countries, was twofold: Partly it was to inform Italian economists and statisticians on the latest trends of scientific thinking in the field of structural interdependence analysis and partly to provide opportunity for exchange of ideas, experience and information between experts in order to develop and improve the analytical tools for analyzing the structural interdependence of the economy. The book is characterized by this double purpose in that some papers are merely expository while others are highly technical. Even the contents of the latter have to a large extent been previously published elsewhere with the exception of those which describe country experience. The quality of the papers is also somewhat uneven.

Nevertheless, the volume represents a very handy and well-organized collection of papers which is to be welcomed as an addition to the already quite rich literature on input-output analysis, linear programming and activity analysis. One of its achievements is that it illuminates the relationships between these three fields and clarifies their respective merits. It is shown that these approaches do not compete, but supplement each other. Linear programming is normative and can be based on empirical data provided by either input-output research or activity analysis, although data on a national scale so far have been provided only by input-output research. When data can be obtained, it depends upon the purpose of analysis whether the input-output approach or the activity-analysis approach is more fruitful.

The book is organized in four parts. Important theoretical aspects of the three methods of structural interdependence analysis are dealt with in Part I. Part II looks upon input-output analysis from the accounting point of view including the problems of aggregation, and it is, *inter alia*, shown that a set of input-output tables or a system of national accounts in the customary form may be deduced from a general system of accounting. In Part III the experience of six European countries is described, and plans for prospective work in the respective countries are outlined. While papers on country experience frequently are rather dull and primarily descriptive, several of these papers present new ideas, and will therefore be valuable to those who themselves want to work empirically in this field. Part IV describes application of input-output analysis to problems of interregional or international trade, to the subject of terms of trade between industries of the same economy and to the problem of economic development. It also includes two papers on the least developed part of input-output analysis, viz. consumption.

Tibor Barna has written an extremely informative introduction where he

has surveyed and summarized the main points of the various authors. He correctly points out that the authors emphasize the elasticity of the input-output or the linear programming approach. The chairman of the Varenna Conference, Wassily Leontief, has written a prefatory note; the Italian Minister of Finance, Roberto Tremelloni, has written a foreword; and a paper by the late Giuseppe Bruguier-Pacini, to whom the volume is dedicated, on "The Changed Tasks of a Faculty of Economics" is also included.

Together with Leontief's books and the volumes on input-output analysis and activity analysis edited by the National Bureau of Economic Research and Oskar Morgenstern, the papers from the Varenna Conference give a comprehensive presentation of structural interdependence analysis, which must be appreciated by all economists and statisticians interested in these problems.

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Nasjonalregnskap: Teoretiske Prinsipper (National Accounts: Theoretical Principles). By ODD AUKRUST. Social-economic Studies, No. 4. (Oslo: Statistisk Sentralbyrå. 1955. Pp. 123. Kr. 3.00.)

In 1946, summing up the first ten years of intensive work on national accounts for various countries, Carl Shoup mentioned "a substantial amount of activity" in Norway. In the ensuing decade, the fruits of that activity have become evident. Odd Aukrust, now chief of the research department in the Norwegian Central Bureau of Statistics has made a major contribution in this field. He was in large part responsible for the earlier volume, *Nasjonalregnskap 1930–39 og 1946–51*, and has now written the promised companion volume on theoretical principles. It is important to emphasize, as the author does, that this work is primarily a discussion of certain theoretical principles that have a direct bearing on empirical research, rather than a general or comprehensive theory of national accounting.

This monograph was designed to serve three purposes. In addition to the purpose already mentioned, it is the fourth in a series of social-economic studies that present historical, theoretical and analytical reports on the Norwegian economy by the Central Bureau of Statistics. Combined with a part of the earlier volume mentioned above, this monograph has been accepted by the University of Oslo as Mr. Aukrust's doctoral dissertation. Just as the author points out the problems involved in constructing a single set of national accounts designed to meet more than a single purpose, so must one view this multipurpose volume, which in some sections briefly reviews recent thinking on certain aspects of national accounting and in others contributes to work already done.

According to the "Opening Remarks," when Aukrust began his work on national accounts for Norway, he was impressed with the need for a fully worked out theoretical system that was both logically consistent internally and combined simplicity of conception with abundance of detail. With considerable practical experience behind him, he has pursued this objective.

Chapter I contains a discussion of the purposes of national accounting. Chapter II concerns historical aspects of theoretical developments with special attention to the works of Frisch (the eco-circ system), Stone (the payments-flow approach) and Leontief (input-output analysis). From the works of these men, Aukrust derives the major components of his own approach. Explicitly, he rejects certain of their tenets and substitutes his own. The second chapter concludes with a section telling in what ways international work, especially that of the O.E.E.C., has influenced the development of Norwegian national accounts.

Chapter III deals with classification problems, contrasts institutional and functional approaches, and proposes an axiomatic solution which is described in general terms in the text and is presented in some detail in the appendix. Chapter IV, "The Problem of Valuation," restates the now familiar Norwegian preference for national aggregates in terms of market price as opposed to factor costs. The exercise in logic applied to valuation in one section of this chapter does not come to grips with the difficulties of this fundamental problem, but it seems clear that Aukrust did not attempt that task here. The chapter ends with a short section on measurements in constant prices over time.

In Chapter V, "The Observation Problem," Aukrust presents a standard accounting framework which can be used for each transactor or sector of the economy. Four double-entry accounts separate real and financial transactions, income, and a balancing account for changes in assets. Each account is devised to correspond to a definitional equation in the eco-circ system, and of the four, any three can be taken as independent equations. In this system there can be no overlapping of financial and real transactions, and a clear distinction is made between requited and unrequited transactions. The properties of a "fully articulated" and "centrally described" system are set forth and then evaluated in terms of practicality. The two final chapters relate the foregoing theoretical ideas to practices of assembling, classifying, evaluating and presenting the data of national accounts with special reference to the Norwegian experience.

In the appendix, the author has attempted to work out an axiomatic treatment of classification and valuation problems. To serious students of national accounting, this is likely to be the most interesting part of his monograph, but here many are likely to be stopped by the language barrier. That part of the English summary covering the appendix will only whet their appetites. No one is better qualified to remedy this situation than Aukrust.

JANET A. FISHER

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Size, Structure and Growth of the Economy of Jamaica—A National Economic Accounts Study. By ALFRED P. THORNE. (Kingston, Jamaica: Institute of Social and Economic Research, University College of the West Indies. 1956. Pp. 112.)

This study, undertaken at the request and with the cooperation of the government of Jamaica, achieves three results: (1) it gives a picture of the size, structure, and growth of the island's economy; (2) it lays the founda-

tions for continuing national economic accounting as a basis for the formulation of economic policies for the island; (3) it introduces refinements in national economic accounting which may be usefully applied also in other underdeveloped countries.

1. Professor Thorne's study is the first attempt to picture the Jamaican economy in a frame of national accounts. The sector accounts are for 1952, the last year for which figures were available at the time the inquiry was undertaken; but in addition some comparisons with earlier years as far back as 1938[1] show the trends of change and progress. Striking features of Jamaica's economy shown in the 1952 still picture are: (a) the smallness of the national income—£90 million or about $174 per capita, (b) the small amount (27 per cent) contributed to gross domestic product by agriculture, forestry, and mining in a country still "colonial" and "underdeveloped," (c) the large amount of investment—gross investment was 14.1 per cent of gross product, net investment about 9.3 per cent of gross product, compared with a figure for net capital formation of less than 5 per cent in most underdeveloped countries. But the author warns that capital consumption estimates are probably too low.

The moving picture obtained from comparison with estimates for earlier years reveals that between 1938 and 1952 gross domestic product rose from £18.6 million to £95 million and to an estimated £105 million in 1953—an increase of 465 per cent. This spectacular increase becomes less impressive when allowance is made for changes in prices and population. Per capita gross domestic product at constant (1950) prices rose from £52 in 1938 to £60 in 1952, or about 15½ per cent.

More remarkable are a decline of one-third in the percentage contribution of primary industries to gross domestic product, counterbalanced by a doubling of the percentage contribution of manufacturing and a 300 per cent increase in that of public utilities. This notable advance in industrial production upsets Benham's opinion of 1943 that high labor costs would preclude industrial development in Jamaica.

2. The principal purpose of the study, more important than that of presenting a national accounting picture of the Jamaican economy, is to lay the foundation for a system of continuous national economic accounting to help the government in formulating, testing, and currently revising its economic policies. Thorne suggests that accounts not only be kept continuously but that "forecast accounts," to be continuously checked against actual performance, should serve as guides to policy makers.

3. In setting up national economic accounts for Jamaica, Thorne introduces some noteworthy innovations: he deals with 11 sector accounts, as against 5 accounts used in the United States; he puts all export industries into a separate account instead of following the custom of lumping them with the "Rest of the World" account; he has a separate account also for public utilities in order to show the growth of this industry with its stra-

[1] Figures for some of these earlier years were obtained from F. C. Benham, *The National Income of Jamaica*, 1942 (Bridgetown, Barbados, 1943); Phyllis Deane, *The Measurement of Colonial Income* (1948) (Cambridge, England, 1948); and Central Bureau of Statistics, *National Income of Jamaica, 1943, 1946* (Kingston, Jamaica, 1948).

tegic importance for developing countries. The author then consolidates his 11 accounts into the system of 6 accounts recommended by the United Nations, but he improves upon the United Nations system by separately showing the value of subsistence consumption and gifts from abroad.

Thorne acknowledges the Keynesian character of his study, but he seems troubled, and rightly so, by the question of "how far the tools used in 'Western' countries can be serviceable in Jamaica." The fact is that underdeveloped countries desiring to raise levels of living through industrialization cannot significantly use either the economic analysis or the economic policies of advanced capitalistic nations; they cannot rely on monetary-fiscal policies or on private enterprise to achieve their goals.

Unemployment is a chronic disease of many underdeveloped countries, as it is a frequent acute disease of advanced capitalistic nations. In the latter countries fiscal policies designed to increase income and demand can be effective in putting idle men back to work in idle plants. To apply such policies in Jamaica would be useless. The ten per cent of the total population of Jamaica who are unemployed even in prosperous years cannot be put to work in idle plants because there are no idle plants. The first thing that must be done is to build the plants in which the idle could be employed. What is needed, as Thorne emphasizes, is capital formation.

But capital formation in underdeveloped countries, again, does not respond to the type of encouragement relied on in "Western" countries. It may be sufficient "for a democratic [Western] government to do such things as influence the rate of interest, change the system of taxation and incur deficits in order to influence the rate of . . . investment, and consequently the . . . rate of development." Stronger stimulants are needed in underdeveloped countries, where private enterprise has not been able or willing to undertake the investments needed to bring about industrialization. Success, where it has been achieved, was due largely to direct government intervention.

This is certainly true of Puerto Rico which is now emulated by the underdeveloped countries. If private enterprise had been relied on to bring industrialization to Puerto Rico, it would never have come. After all, private enterprise had its opportunity for hundreds of years under Spanish rule and for half a century under United States rule, yet Puerto Rico continued to be a poverty-ridden, capital-poor country until the Insular Government launched "Operation Bootstrap" and stepped in with plans and funds for investments too risky for private enterprise.

In Jamaica, too, capital accumulation and consequently greater employment opportunities and rising standards of living depend largely on direct government planning and direction. Private enterprise has not invested enough in the past and is not likely to invest enough in the future to assure the desired economic progress. Thorne's suggestion for a "development bank," presumably after the Puerto Rican model, indicates his awareness of the need for government action to promote investment.

Excessive emphasis on Keynesian concepts and policies in dealing with the problems of underdeveloped countries is perhaps inherent in the na-

tional income approach and not particularly a fault of Thorne's book. It would not be fair to criticize him for having chosen a national accounts approach for his study. After all, that was the kind of study he was commissioned to undertake. He has carried out his assignment with thoroughness and scholarliness and the product of his research, of obvious practical importance to Jamaica, is a significant contribution to the literature on national economic accounting.

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Economic Systems; Planning and Reform; Cooperation

Comparative Economic Development. By RALPH H. BLODGETT and DONALD L. KEMMERER. (New York: McGraw-Hill. 1956. Pp. vii, 557. $6.00.)

The title suggests a departure from the conventional textbook approach. "This book," the authors claim, "is not intended to be a text in economic history, nor is it intended to be a text in comparative economic systems. It is a combination of the two designed for use as an orientation type of course." Unfortunately, they did not succeed in combining the two approaches.

To say that the book is valuable, is to judge it by its lucidity, factual accuracy, and by the authors' remarkable skill in condensing the economic histories of four major industrialized countries to fit into an average-length textbook. These countries—United States, England, Germany, and Russia—were chosen, presumably, because each of them represents a distinct system. They are treated in four separate, strictly historical surveys. Each survey is divided into an equal number of chapters dealing with developments in various sectors (population, resources, agriculture, transportation, manufacturing, finance, labor, commerce).

The first three countries are judged generally by the familiar standard of "pure" capitalism (profit motive, freedom of enterprise, free competition, respect for private property). Though the United States has deviated considerably, has abandoned the gold standard, orthodoxy in monetary and fiscal policies, the balanced budget, etc., etc., and though politicians (the authors fear) tend to pervert the government's function as an economic stabilizer to their own "spend and elect" ends (p. 124), it still exemplifies "capitalism." England, on the other hand, a country which until recently had an undisputed claim to the title, is now in a state of "decadent capitalism" *i.e.*, the "welfare state," a deplorable state, indeed, which she brought upon herself by excessive controls and welfare schemes. Now, this is definitely unkind, particularly to the present government which is trying so valiantly to square its liberalization program with dollar gaps, military commitments, free consumer spending, inflation, etc.

The authors, apparently reluctant to drop National Socialism or Fascism as a distinct "system," by including Western Germany naturally found a niche for it. It is surprising how much textbook space is still devoted to a political regime which without constitutional restraints and with no respect

for human rights almost achieved its two objectives of stability and conquest by extending *already existing* controls and stabilization schemes, and by furthering cartelized integration. Still, businessmen "continued to own and operate their businesses and to be motivated by consideration of profit and loss" (p. 456). Nor were they deprived of "the customary capitalist incentives." Thus, basic institutions remained intact. Besides, the "return to capitalism," as described by the authors, "miraculous" though it was, was achieved by means far from typical of "pure" capitalism—Ehrhardt's liberal protestations notwithstanding.

What little comparative evaluation the authors have to offer is combined with a summary in an eight-page final chapter, and refers in a general way only to the four nations discussed. This limited approach is explained simply by the fact "that the human mind can absorb only just so much information at one time without becoming confused" (p. v) and that the book was intended for freshmen and sophomores anyway.

Now, couldn't we avoid confusion, if we let our freshmen mature, and, perhaps in their junior or senior years, confront them with a coherent framework within which to examine the differences in conditions and problems of growth, natural endowment and historical development of both developed and underdeveloped countries, the problems of sharing capital and productive techniques, in short to a comparative analysis of systems at different stages of development, without neglecting, however, the interaction of economic, political, and social factors. Is it necessary to subject our students to historical detail, much of it of secondary importance, or—the other extreme—to abstruse deductions as to the accuracy of comparative measurements? Of course not! Sometimes I feel that half of our task is accomplished, if we can only convince them that developmental projects are not just philanthropic operations.

As it stands, the book does not fulfill the proper function of a comparative development text. It may still serve a purpose, if a sequel is planned—a sequel that would justify its title.

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Business Fluctuations

Economics of Employment and Unemployment. By PAUL H. CASSELMAN. (Washington: Public Affairs Press. 1955. Pp. viii, 183. $3.25.)

Professor Casselman has set himself a major task in this slim volume: to provide a rounded study of the economic theories, factual realities, and policy approaches applicable to employment and unemployment. To bear out the author's own view that he has stressed the policy areas, his study would appear to require extensive treatment of the integral relationship of employment to other basic elements in the functioning of the economy, including such factors as investment, output and income. There is, however, only limited treatment of the impact of such interrelationships on unemployment policy. Although lacking depth of analysis, the volume does pro-

vide a useful outline of the elements which must be considered in taking a positive approach to the maintenance of high and stable levels of employment.

The value of this guide is enhanced by the author's clear statement of his frame of reference. It is his view that private enterprise alone cannot ensure the goal of relatively full employment, that some measure of government intervention is necessary. Casselman has well stated the positive benefits derived from mild government intervention to ensure stable and high-level employment in a democratic society, and its effect as a bulwark against collectivism. He makes clear that such government action must be fluid and flexible, and indicates the range of approaches from monetary and fiscal measures to public works, depending upon the surrounding circumstances. His view is hardly theoretical, for study of governmental policy in this country over the past two decades demonstrates the continuing concern with stability in employment. Unfortunately, while suggesting that such intervention has important implications for freedom of enterprise and collective bargaining and for stable prices as well as for full employment, he has left these implications unexplored.

Casselman deals with the numerous factors which determine labor supply and demand. Particularly useful as a device for crystallizing discussion of the subject is his classification of these into economic factors (*e.g.*, effective demand, foreign demand, capital investment, standard of living, profits, wages, hours of work, and technology); personal noneconomic factors (*e.g.*, age, physical condition, sex); natural phenomena; and war, industrial unrest and demographic influences. The likelihood of duplication and arbitrariness inherent in any attempt to classify such a complex of factors does not detract from the utility of the effort. With this classification as a tool, he contrasts the long-term, cumulative and structural elements which generally determine labor supply, and the short-run propensity to change of the infinite number of individual demands which determine the demand for labor. Implicit in the analysis is the conclusion that the demand factors can be more amenable to control, while the supply factors are more inexorable in their economic impact. A question can be raised regarding the placement of the various factors on the demand or supply side (*e.g.*, unions are placed solely on the supply side, while technology is placed solely on the demand side). Further, the author does not discuss the interaction between the longer-run factors making for the supply of labor and the shorter-run factors involved in demand. The bolstering effect of the long-term population growth trend on investment and its concomitant effect upon output and employment have obvious implications in the short run for labor demand, as well as for labor supply in the longer run. But the author hardly treats of the postwar development in long-term population growth and in technological change prospects; instead, he attributes the sustenance of employment during the past decade largely to "abnormal factors," such as defense expenditures.

The treatment of seasonal factors in employment provides an interesting contrast with that of output and employment. The author has made good

use of the substantial literature on seasonality in employment. The result is an intensive treatment, including consideration of statistical techniques to be applied in eliminating the effects of seasonal employment in employment series. The treatment of output and employment, on the other hand, is thin, reliance having been placed largely on studies of the 'twenties. This study apparently was completed prior to the respective explorations of the Joint Committee on the Economic Report, Stanley Lebergott, and John Kendrick.

The chapter on cyclical employment is primarily a good summary of business cycle theory, but does not provide a clear factual description of employment and unemployment in the cycle. Structural, frictional, technological, casual and personal unemployment are grouped as forms of unemployment other than cyclical and seasonal. The author places much emphasis on the structural form—resulting from changes in economic structure and economic environment—which, as he states, was largely ignored by Keynes. It is, however, unfortunate that Casselman does not accompany his general treatment of structural change with an analysis of such contemporary phenomena as the growth in population, the shift in employment to the service trades, existence of "depressed" areas, and technological development.

JOSEPH P. GOLDBERG

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Money, Credit and Banking; Monetary Policy; Consumer Finance; Mortgage Credit

Bankpolitik. By HEINRICH RITTERSHAUSEN. (Frankfurt/Main: Fritz Knapp Verlag. 1956. Pp. 224. DM 16,80.)

Professor Rittershausen has written a challenging book, for which he claims two major purposes: First, to present a realistic picture of money and credit aimed at "simplification and elimination of contradictions which make the understanding of 'theoretical' explanations so difficult for bankers." A major example of rejected theory is the quantity theory of money, and a significant part of the book consists of an attack on it. The second purpose is to present monetary theory as part of general price theory, and to go beyond Keynes and his successors in integrating the two.

The book is substantially more successful in the second purpose—integration of price and monetary theory—than with the first aim, "realism." The attack on the quantity theory presents, in part, the usual strawman, and must be tiresome to many American readers at this stage of economic literature. Most bankers would find a substantial part of the book an exercise in logic, and they may well wonder about its relation to "realism." More important, some of the theories cannot be squared with actual historical events. For example, the author sees a direct relation between government deficits and price movements. However, in the United States since 1930 not only has there been no direct relation between deficits and prices, but in most of the years changes in the deficit and changes in prices moved in opposite directions.

The book provides an interesting list of ten major differences between the German and the American monetary systems; some of them will surprise American readers. Among the claimed differences are: (1) In the United States, short- and long-term credits are not strictly separated, as they are in Germany, where long-term deposits are administered and invested by specialized institutions. (2) There is no large public debt outstanding in Germany. As a result, open market policy does not operate in Germany as it does in the United States. (3) Because of the large public debt outstanding in the United States, and the need to keep interest rates low, interest as an instrument of the central bank is largely ineffective. In fact, as the author sees it, the Federal Reserve Board sees as its primary task to assure low interest rates for government credit. In Germany, on the other hand, the central bank's major task is to assist in the development of the private economy.

American readers may well be disappointed with the sketchy treatment of government policies. The author regards the maintenance of price stability as the major purpose of government credit policies, and a balanced budget as essential for currency stability. This is treated in the nature of an assumption, rather than as something to be discussed, and as a result there is no analysis of alternatives, such as stability of income and employment.

HANS A. ADLER

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De Omloopssnelheid van het Geld en zijn Betekenis voor Geldwaarde en Monetair Evenwicht. (*The Velocity of Circulation of Money and its Significance for Purchasing Power and Monetary Equilibrium.*) 2nd ed. By J. ZIJLSTRA. (Leiden: H. E. Stenfert Kroese N.V. 1955. Pp. xiv, 235. *f.* 13.—.)

Professor Zijlstra, a member of the younger generation of Netherlands economists, discusses the velocity of circulation of money (*V*) by means of a critical analysis of some important interwar studies of the subject. After a brief summary of the basic work of his eminent fellow-countryman, M. W. Holtrop, the author considers the circular flow of money, the objective and subjective factors determining *V*, and the relation between *V* and the velocity of circulation of goods (mainly following Arthur W. Marget). In dealing with the relation between *V* and the purchasing power of money, he discusses some alternative formulations of the quantity theory, the criticism of that theory by the Cambridge economists (including Keynes), and the countercriticism by Howard Ellis and Marget. Finally, the author touches upon the relation between *V* and monetary equilibrium; however, apart from a critical discussion of F. A. Hayek's concept of neutral money, he confines himself mainly to a schematic summary of the possible effects of changes in the factors determining *V* upon the flow of money (*MV*), largely following Hans Neisser and J. G. Koopmans. He comments on the various meanings of the concept of monetary equilibrium (stabilization of *MV* or of the price level) and states that this concept is a tool of monetary analysis rather than a goal of monetary policy.

The author apparently aims at restating neoclassical economic thought

and does not attempt to make fundamental original contributions to the solution of the problems of monetary theory. He draws logically correct conclusions from reasonable and simple assumptions of basic economic relations, without trying to justify these assumptions by presenting statistical or other factual material. Surprisingly, he does not mention the treatment of problems implying the concept of *V* in postwar economics and especially in national accounting and flow-of-funds studies—a shortcoming, probably inevitable in the first edition of the study (1947), but difficult to understand in the new edition, in view of the pioneering work recently undertaken in the field of monetary national accounting by Netherlands economic theorists (Jan Tinbergen) and by the Netherlands Bank under the leadership of President Holtrop. The author also fails to deal with the basic problem that makes the concept of *V* important for the practical application of monetary policy: Many if not most of the tools of traditional monetary policy (*e.g.*, open-market operations and changes in reserve requirements), while aiming at influencing *MV*, have a direct and immediate effect only upon the stock of money (*M*); therefore, *V* is the most essential element in transforming the effect upon *M* into effects upon *MV* and perhaps further into effects upon the flow of goods.

In spite of these limitations, the study is valuable, not only because it draws attention to the contribution of some economists that have too long been neglected, but primarily because it helps to clarify the concept of *V* and thus to prepare the way for a reformulation of monetary theory in terms relevant to economic reality and to the revival of monetary policy.

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A Discussion on Methods of Monetary Analysis and Norms for Monetary Policy. By H. C. Bos. (Schiedam: H. A. M. Roelants, for the Netherlands Economic Institute. 1956. Pp. vii, 52.)

The avowed purpose of this slim volume is to summarize and clarify the issues involved in recent controversies in the Netherlands over monetary analysis and policy. In addition the author, a staff member of the Netherlands Economic Institute, has contributed a brief discussion on "The Economic Model as an Aid in Describing Economic Processes," which, while quite elementary, is useful in putting the controversy in perspective. The author has limited himself to a very modest amount of evaluation; which is perhaps unfortunate since one feels as he reads Mr. Bos' account of the controversy that the author has a great deal more to say on the subject himself.

While others, including J. Tinbergen and J. G. Koopmans participated in the extended discussions in Dutch journals over the period 1953–55, the principal protagonists appear to have been M. W. Holtrop (who is said to represent the viewpoint of the Netherlands Bank) and H. J. Witteveen. And it is the opposing viewpoints of these two gentlemen that comprise the main content of the volume under review. (Needless to say, this reviewer's understanding of the controversy is gained solely from Bos' account of it.)

The controversy, which is by no means exclusively Dutch, involves the

meaning of "monetary equilibrium"—and of inflation and deflation as deviations from monetary equilibrium—as a core around which differences in theory and in norms for policy are debated. Witteveen employs an exceedingly crude Keynesian model with Robertsonian lags wherein autonomous changes in expenditure together with a multiplier of fixed value determine changes in income. The supply of (or perhaps the demand for) money is assumed to be infinitely elastic with respect to "monetary tensions" (in place of the interest rate); so that no purely monetary influences need be taken into account. Monetary equilibrium is then defined as an unchanging national income. Inflation accordingly can be "a desired *quantity inflation*" or "*an undesirable price inflation*."

Holtrop, in contrast, will have nothing to do with multiplier analysis, assuming (according to Bos) that the marginal propensity to spend is unity in the absence of monetary disturbances. This assumption appears to be merely a formal one, however, since he explicitly admits that part of any rise in income may leak into imports, while a part of any adjustment to disturbances in the money-security markets involves hoarding or dishoarding. In any case, monetary equilibrium for Holtrop means equality of the supply of and demand for liquid assets.

As Bos indicates, with the aid of his own Keynesian-type model, the question at issue is simply: which markets dominate the general equilibrium result in an aggregative general equilibrium system? In a simple model where we have a market for goods and services, a market for labor, and a market for liquid assets, the usual Keynesian assumption is that the first dominates the other two (Witteveen's position). The rationale for the passivity of the liquid assets market is the prevalence of large stocks relative to incremental supplies, a high price elasticity of demand for the stocks, and the resulting significance of speculative decisions in the market.

Pre-Keynesian theory in contrast usually assumed that the goods and labor markets are automatically self-equilibrating so that the only disturbances relevant for policy consideration are monetary disturbances (Holtrop's position). Bos believes that this issue can be resolved only by the empirical testing of econometric models, a view that Witteveen might accept, but not Holtrop, who prefers apparently the "qualitative reasoning" of the experienced central banker.

At the risk of further feeding the fires of controversy this reviewer would like to make a few suggestions. First the labor market may not be passive in the sense that either Keynes or the pre-Keynesians assumed it to be. It may and often does force difficult adjustments on the other markets, further complicating the concept of "monetary equilibrium." Second, both Witteveen and Holtrop may be right about their assumptions depending on which phase of the business cycle we are experiencing. There are very few in our profession today who would put primary emphasis on monetary policy as a means of checking and reversing a downturn. On the other hand, for a variety of reasons it seems reasonable to assume a marginal propensity to spend in excess of one in the upswing of the cycle until some sort of ceiling is reached.

This brings us to our third and last point which concerns the problem of maintaining output at the maximum level in an economy that is growing. In his only reference to growth Bos assumes that all factors of production are growing in the same proportion. This, however, assumes away the principal obstacle to the maintenance of uninterrupted growth—the existence of a ceiling; for it is only when the factors are growing at different rates that the economy periodically reaches limits to growth that are not easily overcome by social policies. What is needed is a constant adaptation of techniques of production to the differential rates of growth of factors as well as to the capricious requirements of technological progress; and this may require movements of rates of return to factors and of their relative shares in income that our traditional social policies simply cannot enforce. Somehow a concern over the meaning of "monetary equilibrium" in a static context seems to avoid the really basic questions for social policy in growing economies.

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Public Finance; Fiscal Policy

Finanspolitikens Ekonomiska Teori. By BENT HANSEN. Statens Offentliga Utredningar, 25. (Uppsala: Almqvist & Wiksells. 1955. Pp. 403.)

Finanspolitikens Ekonomiska Teori is divided into three main parts.[1] Part I is concerned with general problems and methods in fiscal theory. Also special attention is given to issues concerning budget balancing and tax incidence. Part II deals with the microeconomics of fiscal theory, focusing primarily on household spending and saving with only cursory treatments of the theory of the firm and the behavior of "organizations." Part III is a treatment of macroeconomic fiscal theory. As Hansen himself points out, there is little integration between Parts II and III (or for that matter between Parts II and I)—a lack he attributes largely to the inadequacy of microtheory and the need for empirical work in this area before it will be possible to build a more satisfactory and realistic macromodel on micro foundations.

In Part I Hansen poses a basic "rule of thumb" (stated to be "by no means without exception"), that in certain important and commonly used

[1] Readers familiar with Hansen's *A Study in the Theory of Inflation* (New York, 1952) will note that there is remarkably little in common between these two books except for the logical tightness of the arguments, the fact that both deal in some way with inflation, and some general features of methodology. The former book took as its point of departure the traditional period-analysis approach that has marked the development of Swedish economic thought ever since Lindahl's work in the 1930's, bringing to this approach fresh insights that gave it new life. In *Finanspolitikens Ekonomiska Teori* period analysis occupies only a small place. Also, in the earlier book problems of over- and undersupply (or demand) in factor markets were given equal emphasis with such problems in consumer-goods markets. But in this book it is capital goods rather than factor markets that are paired against consumer-goods markets, and the capital-goods markets are considered almost exclusively in their relation to the policy goals of "full employment" and of stable money—defining the latter in terms of consumer-goods prices only.

types of economic models the number of means (or parameters) that must be manipulated by the government to attain given ends is equal to the number of ends.[2] This rule sets a pattern for the analysis through much of Part III. It has been criticized for lack of realism in failing to take into account the multiplicity of ends in fact involved in public policy, the limited number of means or action parameters available to the government, the limited permissible ranges of adjustment of such parameters, and the fact that in practice this last consideration may (and often does) imply that more than one means must be used for attainment of a given end. There can be no doubt that Hansen himself is quite aware of these problems. He avoids them primarily by a rigorous limitation of his analysis to consideration of selected goals and by the ways in which he delimits his theoretical models. This limits in turn the practical applicability of some of his conclusions. It may be justified as necessary simplification in the stages of rebuilding—one might even say of building—a groundwork for a sound fiscal theory that can then be elaborated to yield practical results. However, one may wish that he had not so completely abstracted from problems of structural adjustment within the consumer and the capital-goods sectors, and that he had given more attention to dynamic process analysis.

Hansen's discussion of budget balancing has evoked considerable reaction in Sweden. This analysis centers around the distinction between action parameters (public means) and endogenous variables. He argues convincingly that budget surpluses and deficits are not parameters of public policy and that no simple relation exists between changes in the budget balance and changes in the functioning of the economy.[3] The defense of those attacked by Hansen has been that the budget balance may nevertheless be useful as a practical indicator of other things, and that his analysis is not as contrary to theirs as he seems to assume. However, this defense is hardly adequate, for the emphasis in analysis that follows from Hansen's approach is quite different and leads to different results in important cases.

The most important chapters of Part II are those dealing with the household as spender and saver, and comments here will be confined to that analysis. The author develops an intertemporal theory closely related to Hicks and Fisher, but differing from them in the analysis of goals of saving and their implications. With this model as a background he proceeds to examine the effects of various fiscal policies on household spending and saving. Most of his analysis is concentrated on two simple cases, a proportional income tax and a general sales tax, and then extended to more complex cases (such as a progressive income tax) and to other fiscal meas-

[2] This is a proposition argued also by Tinbergen, but Hansen's approach differs from Tinbergen's in being more abstract rather than econometric and empirical, and it is presented in a broader framework.

[3] Simple rules of thumb such as that "deterioration of the budget balance gives rise to expansionary tendencies" are shown to be untenable. They are untenable not because the budget balance is merely an approximation, but because it is not an approximation to the parameters that require attention.

ures. Interest rate policy is considered in relation to these fiscal policies. The results with respect to consumption and saving are shown to vary drastically with the preference functions assumed, especially in the short run, pointing up the need for more empirical investigation. In comparing the effects of income and consumption taxes on spending and saving Hansen distinguishes three cases: (1) when the ratios of taxes to income are the same, (2) when the two taxes have the same yields, and (3) when the same level of real consumption is sought (and realized) as an end of the tax policy. On the first two his results are largely refinements of conclusions of earlier writers, except for an important analysis of some previously unrecognized assumptions concerning interest rates.[4] In the third case, he focuses on analysis of the tax burden. Three possible definitions of the lightest burden are suggested: (a) the tax that puts the household on the highest possible indifference curve consistent with the reduced level of consumption (the real or subjective burden); (b) the tax involving the lowest ratio of taxes to income (the nominal burden); (c) the tax leaving the highest amount of saving. He reaches the somewhat startling conclusion that by criterion (a) the consumption tax is superior to the income tax. Comparative effects of the two kinds of taxes when the burden is defined by criterion (b) or (c) are indeterminate.

Part III, which develops a macroeconomic fiscal theory, first considers the problem of defining explicitly the two goals of public policy around which most of his analysis will center. These are a stable value of money, defined as stability in the index of consumer-goods prices, and full employment, defined as equilibrium of demand and supply for labor (regardless of the level of employment). Analysis is then built on a highly simplified static short-term model for a closed economy, a model subsequently elaborated to take into account capital growth and the impact of foreign trade. Four sectors of the economy are distinguished: (1) consumer goods enterprises; (2) capital goods enterprises; (3) wage-earners' households; (4) enterprisers' households. For (1) and (2) he sets up standard-type maximization equations using marginal analysis, and for (3) and (4) equations defining disposable income. Two other equations give conditions of equilibrium in the consumer-goods and the capital-goods markets. The places of ten fiscal-policy parameters and of government-controlled interest rates in the model are developed briefly. Although the short-term static model does not say much, it lays the groundwork for subsequent analysis of fiscal measures.

In applying this model Hansen starts first with the assumption of an equilibrium situation and considers the effects of fiscal policies that disturb that equilibrium and the policies called for to neutralize such disturbances. Here results are relatively puerile. But he then goes on to a more interesting

[4] This is especially important in the second case, when the two taxes have the same yields. Abstracting from the possibility that savings goals may depend on the ratio of posttax income to pretax income and assuming that interest rates vary inversely with this ratio, he concludes that when savings are positive an income tax with some given yield has less effect on real consumption and real saving and more effect on nominal saving than a consumption tax yielding the same revenue (and inversely when savings are negative).

discussion of fiscal policies appropriate when disturbances to equilibrium arise from within the private sector of the economy. The analysis is still highly abstract and static, the disturbances arising in some one variable spontaneously, without any consideration of causal mechanisms. For this reason among others it takes a good deal of patience on the part of the reader to wade through Hansen's various cases, and more than a little self-control to wear the large blinders required by his assumptions. Yet the struggle is well worth while.

Special attention is given to direct versus indirect taxes, and among the latter to taxes on consumption versus capital goods. Here interest rates are regarded primarily as alternatives to capital-goods taxes. The most interesting part of the discussion is the consideration of fiscal policies appropriate to maintaining stable money (consumer-price indexes) and full employment given certain types of changes in production functions. Its greatest value is probably in pointing up little recognized contrasts in the roles of these different fiscal measures, contrasts that have considerable validity even with relaxation of Hansen's stringent simplifying assumptions.

Before going on to the more complex problems associated with wages and wage policies, Hansen devotes a chapter to long-term problems. The treatment is highly formalistic, and the only real modifications of the short-term model are introduction of the effects of capital growth and of private wealth on production functions and on demands for consumer and capital goods. Lip service is paid to the role of liquidity, but that is all. Period analysis is invoked, but with a recognition of the practical problem of calendar time versus the abstract "periods" within which plans remain unchanged. The implications of this distinction and of the length of the time period for the use of simultaneous versus recursive models are mentioned, without any attempt to follow through in terms of Hansen's own constructs —though this is a subject on which he has written, with Ragnar Bentzel, an article now famous in Scandinavia. On the whole Hansen's attempt to "dynamize" both forward and backward in time is disappointing.

No one has yet been very successful in tackling problems of wage policy in relation to price levels and full employment (however defined). That Hansen meets with very limited success in this endeavor is hardly surprising. He recognizes some of the problems that arise in using his definition of full employment when the labor market is nonhomogeneous (with mobility among markets limited), but he is not successful in extricating himself from the difficulties. As he himself points out, given heterogeneous labor markets the nature of the "equilibrium concept of full employment" must depend on socially emphasized value norms that put first a more or less complete elimination of absolute unemployment or that emphasize maximal production in some specifically defined sense. But here he stops, even though his later discussion of the effects of disturbances from outside economies might have provided some clues for elucidation of his wage policy and related problems. Paradoxically at no point in his book does Hansen's neglect of structural problems and of interrelations among endogenous variables over time appear to be so serious as here where he begins to attack them. The defect is not remedied by his consideration of the im-

portance of various union goals as restraints on or conditioners of public policy.

Hansen's main conclusions in summing up his wage policy chapter are: (a) that in principle government has disposal over means to attain the goals of stable money and full employment (as he defines it, now somewhat ambiguously) regardless of changes that may occur in money wages; (b) that this is made easier if there are coordinate changes in money wages. The relative optimism of his conclusions is due in part, as Hansen himself recognizes, to his definition of full employment and to his assumption that unions do not insist on policies in direct conflict with generally accepted social goals. A more solid basis for this optimism is his demonstration that government can, by indirect means, influence the total wage bill without compromising the goals of full employment (again in his equilibrium definition) and stable money—and that it can do this in a manner consistent with goals in fact commonly emphasized by unions.

When he comes to modify his analysis to take into account international trade and the impact of this on the domestic economy, Hansen refines his fiscal policy analysis and puts greater emphasis on special types of both fiscal and monetary policies that are more selective in their impact (also, monetary policies considered include quantitative restrictions as well as interest rates). He concludes among other things that for an economy with significant international trade it may be difficult if not impossible to hold the consumer-price index constant without government-enforced adjustments in the value of money in international exchange.

The final chapter dealing with "uncertainty" is the most disappointing of all. The uncertainties considered are not those of decision-making units within the private economy, but only uncertainties on the part of government concerning the economy's mode of functioning (the appropriate model of the economic system) and the external conditions that may affect the economy.

Summing up, it is clear that Hansen's most important contributions are those that can be made with theoretical tools of a relatively static nature. What he does in these ways is important and far outweighs the fact that he has failed to genuinely dynamize his analysis or to take account of many important structural features of an economy (both static and dynamic). Moreover, there are many points that are suggestive concerning potentially fruitful future research—both empirical and theoretical. Despite its manifest limitations, this is an important book.

MARY JEAN BOWMAN

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An Expenditure Tax. By NICHOLAS KALDOR. (New York: Macmillan. 1956. London: Allen and Unwin. 1955. Pp. 249. $2.75.)

Kaldor presents us with a spirited, nay passionate, plea for a new approach to progressive taxation. He advocates that the progressive income tax be replaced, at least in part, by a progressive spendings tax. Such a tax, he believes, is no less equitable in principle, and more equitable in practice.

Moreover, he considers it superior in its economic effects. Britain needs a higher level of capital formation, and the necessary resources must be released by reducing luxury consumption. Since such consumption is financed largely by dissaving, this cannot be dealt with effectively by an income tax. A spendings tax is the answer. Although Kaldor devotes more space to the equity aspects of his case, the need for increased capital formation seems the crux of the matter.

The book, while small in size, excels in a high idea-to-page ratio. It makes a splendid contribution to a rethinking of the traditional principles of taxation. Like the tracts of old, it may even have an effect on the actual course of legislation.

Kaldor agrees with the advocates of the income tax that taxation should be progressive according to means, and that only taxes levied on persons are capable of achieving the necessary graduation and differentiation. However, he feels that actual expenditures on consumption are a better index than income or potential spending power. He holds with Hobbes that a person should be taxed "by what he takes out of the common pool, not by what he puts into it."

Questions of equity being essentially matters of taste, there is no way of telling whether accretion or spending is *the* proper index of equal ability. The choice between the two is a matter of social value judgment, no less than that between regressive and progressive rates. I would rather take accretion, but Kaldor is surely entitled to take consumption.

Kaldor proposes that the surtax schedule of the income tax be replaced gradually by a sharply progressive spendings tax, with marginal rates rising to over 300 per cent. He holds that such a tax will be as, or more, progressive in terms of income than the surtax schedule which it is to replace. Partly, his conclusion follows from the proposed rates of the spendings tax. Partly, it follows from Kaldor's proposition that high-income recipients are heavy dissavers; and a final reason is that high incomes widely escape the personal income tax due to the lack of capital gains taxation. All this helps to explain why the spendings tax appears to have found support in British Labour circles, even if it is assumed that it is to be a replacement for (and not an addition to!) the income tax.

Just how progressive the spendings tax will in fact be depends on how consumers respond to high marginal rates of tax. The more luxury consumption is reduced, the less will be paid in tax, and the less progressive will be the actual distribution of yield, although not the distribution of consumption foregone. As distinct from the income tax, the very purpose of the spendings tax may not be to provide a yield, but to reduce private consumption and release resources for private capital formation. Thus, its impact distribution may have to be measured in terms of consumption reduced, rather than tax paid.

Kaldor holds that it is much simpler to devise a proper concept of spending than a proper concept of income. However, in his highly stimulating discussion, he seems to overstate the difficulties of the income tax and to understate those of the spendings tax.

On the income-tax side, Kaldor stresses the heterogeneity of the income concept, and the difficulties of dealing with various forms of income in a uniform fashion. The present (British) income tax is said to be inequitable because a more or less arbitrary line is drawn between kinds of receipts which are included and others which are not, and because the effective rate of tax discriminates against fluctuating incomes. He feels that the system could be improved in principle by adding a tax on capital wealth, by including all forms of accretion whether realized or not, and by making allowance for averaging. Even then, there remains the difficulty of distinguishing between capital gains which give rise to spending power and are properly taxed, and others (due to a rise in the price level or a decline in the interest rate) which, he feels, do not give rise to spending power and should not be subject to tax.

His critique of the income tax offers many points of interest, although too much is made of the difficulties of heterogeneity. The problem in many cases is one which can be handled by averaging devices. As to points of detail, I fail to see why the accretion concept should require a tax on property in addition to a tax on income, provided that all forms of accretion are included initially as income so that any gain in net worth is taxed at the outset. Also, I am not persuaded that capital gains due to a decline in the rate of interest should necessarily be excluded. Such an increase in capital value, to be sure, does not raise the future income stream to be derived from capital, or the present value of assets as deflated by the prices of capital goods. At the same time, it does raise their value in terms of potential present consumption.

On the spendings tax side, many of these difficulties are said to disappear. We need not worry about retained earnings or capital gains, and need not answer the puzzling question of "when does income accrue?" We must merely determine when consumption occurs, be it out of income or out of capital. We are relieved of the necessity to define total accretion, or consumption plus saving.

At the same time, we are saddled with a new problem, not encountered in the income tax, of having to distinguish between consumption and saving. Why are outlays for schooling and health to be considered "spending," while those for housing or rare pictures are considered "investment"? Are different types of spending—such as spending for *An Expenditure Tax* and spending for lollypops—any more homogeneous than various types of income? What is the rate of interest at which imputed spending is to be determined? Is not the problem of averaging quite similar in both cases? How are we to evaluate business incomes in kind which are, in fact, spending? The conceptual difficulties and the need for arbitrary demarcation, I fear, are about as great in the one case as in the other.

The proof of the pudding, of course, is not in comparing a perfect income tax with a perfect spendings tax, but in comparing both as they turn out in practice. Again, Kaldor tends to overstate the administrative difficulties of improving the income tax, while understating those involved in the spendings tax.

Discussion of the crucial problem of spendings tax administration is limited to one brief chapter. The assessment formula would be consumption =(cash at beginning of year+receipts including income, gifts, bequests, etc.,+borrowings+proceeds from sales) minus (loans made+investments purchased+cash at end of year). The purchase of houses is to be treated as an investment, but an imputed rental outlay is to be treated as consumption. Most gifts and bequests are to be allowed as deductions by the donor, subject to certain safeguards. Some allowance would be made for size of family; and certain additional needs, such as those arising from disability, would be credited. The tax assessment is to be based on information provided by the individual.

While it would be ill-advised for one economist to suspect another of being inexpert in matters of administration, it seems to me that Kaldor shows little recognition of the host of administrative difficulties inherent in a spendings tax. Some problems are similar to those of the income tax, including the determination of consumption in kind. Some difficulties, such as the determination of unrealized income, are dropped; but others, involved in separating consumption from investment, are added. The proper tracing of capital transactions, so important to the spendings tax, will hardly be simpler than the working out of some means of capital gains taxation; many difficulties are bound to arise in drawing a line between spending and saving; and high marginal rates on spending are likely to induce a flock of new compensation and investment practices designed to avoid them. Kaldor's observation that the problems of a spendings tax would hardly be worse than those of a perfect accretion-type income tax is not the issue; the problem is whether a spendings tax in practice would turn out better than the income tax. Perhaps it would, but the opposite seems more likely.

In dealing with the economic-policy aspects of the spendings tax, Kaldor compares its effects on saving, risk-bearing and work incentives with those of an income tax. The discussion of taxation-effects on saving is interesting, and at the heart of Kaldor's thesis. He begins with the venerable Mill-Fisher-Pigou argument that the inclusion of saving in the income tax discriminates against saving while the spendings tax does not. However, Kaldor's point is not so much that the former involves an excess burden, but that saving is held socially desirable. This establishes a preference for the spendings tax. Kaldor feels that the disincentive effect of the income tax on saving is slight for nonproperty owners who save for old age or emergencies. Indeed, one could add that they must increase their saving in order to secure a given nest egg. However, Kaldor feels that the disincentive effect is highly important for wealthy property owners who need not save for this purpose. Whether this is so depends on their preferences between increased consumption and accumulation.

However this may be, it is interesting to note that Kaldor places little emphasis on the traditional Keynesian proposition that the tax burden may be shifted from saving to consumption by reducing the progressivity of the tax structure. This is the more striking since his hypothesis—that

the rich maintain consumption by dissaving—seems to imply that their marginal propensity to consume is zero, consumption being independent of disposable income. This being the case, the traditional proposition (which is based on the hypothesis of a falling marginal propensity to consume) would apply with particular strength. It is not emphasized because the problem is not to reduce consumption in general, but to reduce luxury consumption in particular. Unfortunately, the reader is given little empirical evidence, other than a meagre sample survey of 1951/52, regarding the distribution of saving and dissaving. Moreover, little is done to appraise the quantitative effect of the proposed spendings tax on saving.

Kaldor's analysis of taxation-effects on risk-taking by individuals is based on a distinction between income risk and capital risk. Let us suppose that investments involving little capital risk (such as short-term bonds) yield 2 per cent, while others involving more capital risk (such as long-term bonds) yield 4 per cent. A 50 per cent income tax will reduce the yield on short-term bonds from 2 to 1 per cent, and that on long-term bonds from 4 to 2 per cent. Before tax, the reward for assuming the large capital risk in buying the long-term bonds was worth 2 percentage points. Now, this has been reduced to 1 per cent only. Hence, the investor will shift to less risky investments. A tax on capital value, on the other hand, will not affect the net addition to income which is obtained by shifting from the less to the more risky investment. Hence, it will have no adverse substitution effect. The effect of the spendings tax is said to be similar in this respect to that of the property tax.

This analysis I find rather disappointing. It seems to follow conclusions reached in the 'thirties and makes no use of studies in the analysis of taxation and risk-bearing that have been developed since then. These studies have found that the extent to which losses can be deducted plays a crucial rôle in the effect of an income tax. While Kaldor notes the rôle of loss treatment in other connections, no attention is paid to this factor in the chapter on risk-taking by individuals. The conclusion seems limited in application to the case of no loss offset, and this is hardly the most interesting one.

Next, Kaldor compares the effects of a proportional income and spendings tax upon work incentives. He assumes first, that saving is used exclusively to provide for future consumption. Assuming equal rates of tax, the effective rate of tax per unit of real income will be lower under the spendings tax. Assuming equal yields of tax, this advantage is said to disappear, since a higher rate will be required under the spendings tax. We cannot say which tax will have greater disincentive effects. However, Kaldor believes that work effort will be higher under the spendings tax if the holding of property is considered valuable as such. Under a spendings tax, the worker will have the reward of holding on to his savings until the tax becomes due, whereas it must be paid at once under the income tax. Therefore, the real wage is reduced less. While this may be the case, the basic argument seems to rest on the assumption that a higher effective rate of tax means a lower level of work effort. This may be so, but it need not be.

In a highly interesting chapter on company taxation, Kaldor takes the

view that company taxes should be integrated with the personal income tax, but that taxation of undistributed profits is but a poor approximation thereto. Thus he notes with relief that the company tax could be dropped under a spendings tax approach. Nevertheless, he presents an interesting discussion of the economic effects of company taxation. An analysis of changes in profit margins by industries between 1938–51/53 shows a much stronger increase in competitive than in the noncompetitive industries. If shifting had occurred, we might have expected it to be stronger in the latter group. Thus, the finding gives little or no support to the hypothesis of shifting.

Nevertheless, Kaldor feels that profits taxes will be reflected in higher profit margins in the long run. To begin with, profits taxes will reduce retained earnings and depress capital values. Since dividends are maintained, dividend yields will rise. Eventually, expansion may require that capital be raised on the outside. To attract this capital, commensurate yields must be offered, and to finance these yields, larger profit margins are needed. This, if I understand it correctly, is the chain of reasoning. But, if larger margins are *needed*, does it follow that they can be obtained? If so, why will not management raise prices in the first place, to prevent the decline in capital values?

In all, Kaldor does not feel that company investment has been retarded by taxation. He finds that there has been no stringency of investible funds available to companies for outside financing; and he does not think that taxation of undistributed profits acts as a serious disincentive for company investment.

A further argument in favor of a spendings tax is the familiar proposition of functional finance that the very purpose of taxes is to check spending. Thus, a spendings tax—be it on consumption and/or investment—is the most efficient tax. As distinct from the old fiscal policy view of deficit and surplus as a means of stabilization, the required balance between *ex ante* saving and investment may be secured by a proper mix of incentive taxes and/or subsidies to encourage or discourage spending for consumption and investment. Thus, full employment can be maintained with a balanced budget at whatever rate of capital formation or growth is desired.

It is only in the very last paragraph of his economic analysis that Kaldor briefly notes what, to me, seems the most important point in his testimony on behalf of the spendings tax. This is the proposition that Britain will require a high rate of growth if it is to maintain a competitive position in the world market, that a lower level of consumption is needed to permit this, that this should be accomplished in line with equalitarian principles, and that, therefore, the spendings tax is best designed to meet the bill.

If my comments have been on the critical side, this only testifies to the thought-provoking and stimulating nature of Kaldor's book. It is suited ideally for classroom discussion, and constitutes a high-voltage shock treatment to established thinking.

RICHARD A. MUSGRAVE

University of Michigan

Government Budgeting. By JESSE BURKHEAD. (New York: John Wiley. London: Chapman & Hall. 1956. Pp. xi, 498. $7.50.)

Within recent months two important books on budgeting have appeared written by economists who previously served in the Bureau of the Budget. One is Arthur Smithies: *The Budgetary Process in the United States* (New York, 1955). The other is the book under review. Neither duplicates the other; rather, each complements and supplements the other. The former is concerned with a critical analysis of federal budgeting in this country and with detailed recommendations for budgetary reforms at both the executive and congressional levels. The latter is concerned with the pure theory, the historical development, and the present status of budgeting at all levels of government, federal, state, and local, here and to some degree abroad. Emphasis is placed on organizational and procedural matters. The author however does not look upon organizational and procedural remedies or administrative "gadgetry" as cure-alls. He specifically warns against the extremes of procedural specialists (p. 247).

Government Budgeting is addressed to economists, political scientists, public administrators, and government officials. The book is divided into four parts. Part I, The Budget and Modern Government, provides the historical, institutional, and theoretical setting for the book. Part II, Budget Classification, covers the various methods of classifying budgetary data for the purpose of facilitating rational governmental decision-making. Part III, The Phases of Budgeting, covers all stages of the budget cycle including budget formulation, execution, and review at all levels: bureau, agency, Budget Bureau, White House, Congress, and the General Accounting Office. Part IV, Specialized Budget Problems, covers revenue-estimating, public enterprises, the annually balanced budget, and a pioneering chapter on budgeting for economic development.

The author regards the study of budgeting as a study in applied economics, namely, the allocation of resources between the public and private sectors of the economy (p. vii). Although the budget is defined as a "statement of revenue and expenditure for a future period" (p. 70), the book is concerned basically with the expenditure budget. This undoubtedly reflects the general neglect which the revenue budget has received historically in this country.

The theme of the book is that sound budgeting requires close coordination and integration of policy determination, planning, programming, and the budget-making process at both executive and congressional levels. A sound budget can not be formulated, executed, and reviewed in a vacuum. Improved administrative tools and techniques such as performance and program budgets (the author differentiates correctly between the two, p. 139), accrual accounting methods, program auditing and review rather than mere accountability, and others recommended by the several Hoover Commissions are steps in the right direction toward more rational and intelligent governmental decision-making, but are not solutions in themselves.

Rivalry, friction, and distrust between the executive and the legislative branches of our government have done much to retard efficient and effective

budgeting in this country. In the political area, "pork barrel" expenditures are "recognized as an inevitable and at times a desirable device for reshaping national policy" (p. 322).

While the author has considerable criticism of the Executive Office and Congress on budgetary and related matters, he has comparatively little to say on the deficiencies of the Budget Bureau, unlike Smithies, the Hoover Commissions, and others.

An important feature of the book is the belief that federal budgeting should be integrated with fiscal and economic policy as it relates to economic stabilization and long range economic growth and development. For underdeveloped nations, considerable government planning for capital formation purposes is assumed necessary (p. 470), and mild inflation desirable as an investment stimulant (p. 473). The author believes that it "may be very nearly possible [to have the advantages of inflation yet avoid the disadvantages] as long as the rate of inflation is kept within narrow limits." He suggests that "a 10% annual increase in the level of prices may lead to a serious misallocation of resources" whereas "a 5% annual rate may provide the necessary stimulus to investment and the encouragement to increased employment of available resources." The latter rate sounds like a lot of inflation to this reviewer.

The author makes a misstatement, or perhaps it is a misprint (p. 471), where he says "very often, external economies can be prevented for both the public and private sector by additions to social capital," because he mentions improved roads and rail transport as examples. Obviously he must mean that either external economies can be achieved or external diseconomies avoided by additions to social capital.

The book is well written and documented, and it makes a valuable addition to the literature on the subject.

ERVIN K. ZINGLER

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Treasury Control: The Co-ordination of Financial and Economic Policy in Great Britain. By SAMUEL H. BEER. (New York: Oxford University Press. 1956. Pp. vii, 138. $2.40.)

This little book, written by a professor of government, examines the machinery whereby the Treasury controls the financial and economic policy of the British government. The emphasis throughout is on the official, committee, department, or other agency whereby Treasury pressure is exerted, together with the associated frame of governmental organization, constitutional underpinning, statutory provision, and custom or accepted tradition. Thus little or nothing is said about the substance of the existing financial and economic policies and the reasons for their adoption. Means, not matter, are stressed. The underlying information was obtained chiefly by conversation with informed persons, most of them in the civil service.

The organization of the Treasury is indicated in a brief chapter, which is succeeded by longer chapters on the coordination of financial policy, the coordination of economic policy, and the nature of the Treasury's power.

The Treasury functions through five "sides," those of Establishments, Supply, Home Finance, Overseas Finance, and Economic Affairs. Although the work of all these organizations bears some relation to financial and economic policy, that of Supply and of Economic Affairs is the most relevant.

The coordination of financial policy with respect to expenditures is the responsibility of the Supply "side." The divisions in that branch of the Treasury seek to achieve a balance in the programs of the public services, thereby preventing extravagance in some offerings and parsimony in others. This control is exercised through the requirement of prior approval. No department may vary any activity that has a financial aspect without first obtaining the approval of the proper Treasury officials. The Treasury also has the opportunity to criticize new proposals before they become cabinet policy. Through these two powers the influence of the Treasury is continually being applied. The officials of Supply are in daily or weekly touch with their counterparts in the operating agencies.

In the British government an executive is much more free of legislative control than in the American. He may, for example, even incur liabilities not already covered by an appropriation. Thus the Treasury powers are an important safeguard against abuses. Yet, singularly, these powers are founded, in the main, not on statutory enactment but on tradition.

Organization for purposes of economic policy is younger than for purposes of financial policy. This is, of course, particularly true of economic policy with a Keynesian emphasis. The present arrangement for the coordination of economic policy, which emerged from earlier provisions, dates only from 1947. In that year the Central Economic Planning Staff was transferred to the "side" of Economic Affairs in the Treasury. The CEPS, a small agency, has a professional membership composed almost exclusively of administrators. The chief is the deputy to the Permanent Secretary of the Treasury. The principal officials are four or five Assistant Secretaries and three Under Secretaries. Only one economist is employed. The staff relies on the economic section of the Cabinet Office for economic counsel.

Despite its name, the Central Economic Planning Staff is not a planning body. Its functions rather are to keep the economic affairs of the nation under surveillance and to assist the agencies that make official decisions. The CEPS provides a forum where the views of the departments that deal with economic problems can be presented, brought together, and if possible shaped into some form of agreement.

The power of the Treasury, according to Beer, is not that of command. The Treasury gives no orders either to do or not to do. Its will, rather, is made known through consultations. Even the requirement of prior approval cannot be enforced. A dissenting minister can appeal to the Cabinet in which he and the Chancellor of the Exchequer are members. Yet the Treasury does have power in the sense that its decisions are commonly accepted. That power rests less on the formal responsibilities with which the Treasury is charged than upon the nature of the civil service and the position of the Chancellor under the British Constitution. There is coordi-

nation, and there is enforcement of policy under the plural executive, largely because "there is in British government at the official level a strong tendency to reach agreement and, when conflicts occur, to find as quickly as possible a generally acceptable solution."

The Chancellor of the Exchequer usually occupies a pre-eminent position in the Cabinet. He is a member of the inner Cabinet and often is regarded as next in line to the leadership of the party. This position gives his department great authority. That authority is strengthened by the parliamentary practice, stemming from deep historical roots, of making appropriations, not to departments, but to Her Majesty. The money, having been granted to the Queen, cannot be expended until she so directs. This is done by a royal order to the Treasury, which thereupon places that department in a strategic position with respect to expenditures.

M. SLADE KENDRICK

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International Economics

Sterling: Its Meaning in World Finance. By JUDD POLK. (New York: Harper & Bros., for Council on Foreign Relations. 1956. Pp. xvi, 286. $3.75.)

" . . . the Commonwealth rests on a moral idea, and in that ideal of cooperation between races and creeds lies the best hope for the world's future. But the Commonwealth's unity also depends on such material things as the sterling area (on whose reserves virtually all members depend). . . . " It is from this viewpoint, expressed in the *New Commonwealth* (September 17, 1956), that one should examine this study by Judd Polk for the Council on Foreign Relations. The book's purpose is to provide descriptive information and analysis bearing on the question of whether sterling arrangements are beneficial to its members and whether external arrangements are beneficial to nonmembers, particularly to the United States. No firm conclusion is set forth, but the arguments are valuable and can be readily followed by the neophyte; the work is not theoretical.

The reader is left with a picture of the independent members of the sterling area and of the dependent overseas territories growing in economic importance and tending to throw off the dominance of the United Kingdom, as Canada did, unless the Metropole (U.K.) can restore sterling to its historical role as a world currency or strengthen the regional ties of members of the area. Mr. Polk considers that the latter is the more likely alternative. He does not accept the thesis that the sterling area and the Empire are breaking up and that the repeated crises are the death-throes of British influence which will relegate sterling to the position of a national currency only. Rather, he sees Britain's (and the area's) problems as part of the postwar adjustment and of the long-run structural adjustments which are and will be required, as developing economies grow.

Polk examines the postwar problems which faced Britain and the system of controls used to relieve the several reserve crises. He then analyzes the conditions requisite to the U.K. performing the function of a financial cen-

ter in an appropriate fashion, pointing out that a prime requisite is the ability to provide capital. The U.K. balance-of-payments developments are examined to determine this ability. He stresses the key role of the Anglo-American Financial Agreement as the projected foundation for a return of sterling to its pre-1914 role. He accepts the argument advanced by others that the key failure was in British internal financial policy, but his analysis of the entire gamut of forces causing the collapse of the experiment of convertibility in 1947 makes fascinating reading.

Polk argues that, rather than recovering world-wide convertibility on a pre-1914 basis, sterling will probably play an important role in a regional setting. He stresses the regional aspect on the grounds that financial policy of members of the sterling area will be dominated by considerations of high and stable employment and an expansion of production and that an inadequate flow of international lending will not provide the enticement necessary to draw members away from regional consolidation.

An important pull on some of the independent members of the sterling area, in Polk's view, is the shifting pattern of world trade. England was previously important to these countries because of her dominance in trade and her large imports. While she is still a large importer, many of the International Sterling Area countries are finding better markets elsewhere and are building up their own reserves of gold and dollars. Despite this pull, inertia, he concludes, will probably keep these countries tied to sterling for some time to come.

The dependent overseas territories are not only tied tighter to England politically but also economically. Though several of them are major suppliers of dollars to sterling-area reserves, they have not yet developed plans for economic growth which would assure effective use of these funds for themselves. As they do, he argues, their net contributions to the reserve pool may decline. As the commodity structure of their trade shifts out of the familiar colonial pattern and as they begin to set up independent currency systems within their economies, their dependence on Britain will also diminish. A smaller dependence on sterling holdings for domestic financial purposes, a larger expenditure of foreign exchange earnings with economic growth, and a reduction of the special circumstances which have brought large earnings will alter the key role of the dependent overseas territories as net suppliers of dollars to the area. The result might be changed if sterling-area suppliers could provide the goods which economic development in the DOTs would require.

The relation of the dollar area to the sterling area is examined in a chapter devoted to consideration of depression, dollar shortage, and discrimination. The analysis of these problems is incisive. Polk is not certain that the sterling area must falter in the face of U.S. recession; the "disparate rates of productivity growth" argument as a cause of the dollar shortage is not a substantial one (Britain may well learn to compete in a variety of new industries); and "it is far from clear that discriminatory trade policies actually provide very effective insulation unless they are carried to autarkic extremes." Contrary to the proposals repeatedly urged by Balogh involving wider controls, Polk questions whether the need is not "for margins that

will make temporary disturbances tolerable and for flexibility that will make each national economy responsive to the continuous process of change in the world economy."

In his final chapter, Polk casts up the weaknesses of the sterling area against its strengths and examines the "American" case against the sterling area. He concludes that there are hopeful signs that the causes of postwar crises were temporary and that the relation of U.K. production to the amount of sterling outstanding is improving. Finally, he argues, America has viewed the sterling area too narrowly as a financial arrangement; since it underpins the Commonwealth, which encompasses a host of varied, surging peoples in a peaceful association, it may be desirable to help strengthen its sterling base.

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Modern International Commerce. By Edward E. Pratt. (New York: Allyn and Bacon. 1956. Pp. xv, 677. $6.50.)

The purpose of this book is to describe the practical operating details of the business of foreign trade. Except for comments in the first and last chapters (which are unrelated to the main body of the text), the book is almost entirely concerned with procedures and techniques of business organizations engaged in foreign trade and services. Export trade receives much more attention than import trade because, in Professor Pratt's view, imports commonly enter into conventional channels of trade once they are inside the United States, while the export function often reaches all the way from the point of production to the point of consumption.

Marketing is heavily emphasized in this book. A recurrent theme is that American business methods, especially in marketing, are steadily being extended throughout the world, that methods successful in the United States will, with some adaptations, also prove successful in foreign markets, and that American firms can greatly expand their foreign operations. Although export marketing is stressed, other subjects receive considerable attention. Three chapters are devoted to finance, two to import procedures, and one each to services, documentation and law.

In his treatment of all these matters, Pratt is writing for the practitioner. His descriptions of specific techniques are authoritative, accurate, and useful, but in his discussions of broader aspects of business policy the attempt to furnish similar detail sometimes results in assertion of the obvious. This is relieved, however, by numerous illustrations drawn from the author's rich knowledge of the experience of U.S. firms.

On the whole the book is a good reference manual for persons actively engaged in trade, but it is not of much interest to economists or general readers. Much of the book bears a marked resemblance to the *Foreign Trade Handbook*,[1] although the latter is much more comprehensive.

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[1] E. E. Pratt, *Foreign Trade Handbook*, 3rd ed. (Chicago, 1952).

Industrial Organization; Government and Business; Industry Studies

Demokratie und Monopol in den Vereinigten Staaten von Amerika. By THEODOR KUHR. (Bad Nauheim: Vita-Verlag. 1954. Pp. 172.)

A book on American antitrust problems written by a German for Germans provides an opportunity for American students "to see ourselves as others see us." The book is also of interest as a sample of German academic thinking in the field of competition and monopoly.

The author is a long-time advocate of vigorous antitrust policies. His present work is a revision of one that appeared in 1934, and he has written extensively on monopoly problems. While he enjoys the intellectual companionship of the small school of German "neoliberals," he must find life frustrating in the traditional stronghold of "protrust" policies, where the steel and banking combines, so laboriously broken up by the allies, are now reconcentrating apace, and antitrust legislation, after years of debate, has risen to the dizzy heights of making *some* monopolistic agreements *unenforceable* in the courts.

Kuhr bases his opposition to monopoly on "Christian natural law" from which a respect for freedom and equality is said to flow. He attributes the vigor of American antitrust policy (which he wishes the Germans to emulate) to the British common law tradition and the legislative role it assigns to the judge, whom he assumes to be, typically, a member of an elite imbued with the spirit of "Christian natural law." Conversely, the absence of effective antimonopoly policy in Continental Europe is attributed to the tradition of Roman law, and the subordinate position of the judge as a mere interpreter of statutes.

These legal-philosophical reflections occupy only a few pages in the first and last chapters of the book. The bulk of it is devoted to a description and discussion of the administration of the United States antitrust laws. The discussion is based on secondary sources, and the criteria governing the selection of cases and the distribution of emphasis are not easy to detect. Nearly 30 pages, out of 75, are devoted to resale price maintenance, but of these only three paragraphs (plus some footnotes) to the Miller-Tydings Act and its aftermath, which is pushed aside as conflicting with the "logically consistent" stream of judicial decisions that are discussed in detail.

In the following chapter there is a confused discussion of cut-throat competition and oligopoly, followed by a note on the evils of price rigidity and a review of statistical studies (all American) which are interpreted as suggesting that the largest firms do not have the lowest costs.

This attempt to teach the German academic champions of monopoly the error of their ways is to be commended. It is unfortunate, however, that the success of the venture is marred by a less than adequate command of economic history, economic theory and statistics, and (perhaps inevitably) an insufficiently critical approach to the secondary sources that are used. A few examples will illustrate these shortcomings.

The economic superiority of the United States over Europe is ascribed "primarily" to its prompt response to the threat of monopoly (p. 31). The

author's tendency to overestimate the economic impact of judicial antimonopoly pronouncements leads him to say of the English common law tradition that, contrary to the claims of Marxism, "an idea, namely that of equality, determined the method of production through the centuries" (p. 156).

Competition is said to depend on the existence of cost differences, and under conditions of oligopoly competition breaks down because there will be less difference in costs among a few large firms than among a large number of small firms (pp. 68, 123–25). Kuhr also appears to be unaware of the distinction between (Mrs. Robinson's) imperfect competition and oligopoly (p. 124). In the discussion of price rigidity no account is taken of the fact that the receipts of firms practicing price rigidity can be sources of effective demand.

In support of the claim that the development of the rule of reason in merger cases was followed by "a growth of the concentration movement" (it is not made clear whether this means increasing concentration or more mergers) Kuhr cites figures illustrating high (but not increasing) concentration, states the number of firms bought or merged from 1940 to 1947 (with no comparative figures), and mentions the reduction in the number of firms between 1941 and 1943 (due, of course, to the war) with no reference to the subsequent increase. There is no reference to the statistical studies that have cast grave doubt on the thesis of increasing concentration (pp. 59–61).

On the subject of the optimum size of firm the author reports that "by far the most important publication" is the Federal Trade Commission's study on the "relative efficiency of large, medium-sized and small business" (the famous TNEC Monograph No. 13) which is discussed in detail without reference to the severe critiques of its methods that have been published.

In spite of the instances of loose reasoning and even some confusion, the book appears to be an improvement on much of the discussion that has surrounded the German antimonopoly bill. Kuhr has set himself a task that could have been done better, but one should be gratefully surprised that it was done at all.

G. Rosenbluth

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The Metropolitan Transportation Problem. By Wilfred Owen. (Washington: The Brookings Institution. 1956. Pp. x, 301. $4.50.)

Widespread concern with the problem of urban traffic congestion and other aspects of urban transportation makes the appearance of this volume an especially welcome event. Although urban transportation has been extensively discussed in both technical and popular periodical literature and in various specialized studies, the present volume, so far as the reviewer is aware, is the first to present a comprehensive and integrated analysis of the subject from the standpoints of transportation economics, public finance, and city planning.

In an introductory chapter the author points out that the problem of urban traffic congestion antedates the automobile age, and he holds that the

"Basic causes appear to be excessive crowding of population and economic activity into small areas of land and the disorderly arrangement of land uses that has maximized transportation requirements" (p. 8). Paradoxically, advances in transportation have made possible this urban concentration and the latter now threatens to strangle the transportation system which made it possible. "Transportation has created many of the conditions that people strive to escape, but it has also provided the means of escaping them and therefore the means of avoiding solutions. And it has transported slums to the suburbs" (pp. 24–25).

Evidence of failure to adapt to the heavy dependence upon private automobiles for transportation in urban areas is found in the tardy and limited recognition of the fact that controlled-access highways are necessary for the safe and expeditious movement of heavy traffic; in the permitting of "ribbon" commercial development along main highways approaching urban areas, which has resulted in the creation of blighted areas and in making difficult or impossible the necessary future enlargement of the highways affected; and, in many states, the disproportionately small share of state highway funds allocated to improvements in urban areas. The generally poor financial condition of the urban transit industry is said to arise largely from the fact that although the total volume of transit business has fallen sharply since the second world war the great bulk of the drop has been in off-peak hours, thereby intensifying the already serious peak-hour problem. The conclusion is reached that efforts to improve urban transportation conditions have had only limited success because: (1) there has been no clear understanding of the relative roles which should be played by public and private transportation respectively; (2) sufficient funds cannot be obtained under current methods of finance; (3) no organizational arrangements have been established which have the necessary geographical coverage and which also provide for unified control of all types of transportation facilities within an area; and (4) the problem of congestion has been attacked primarily by efforts to enlarge facilities, with inadequate attention to controlling the demand for such facilities.

Owen maintains that the respective roles of automobiles and public carriers in urban transportation are to a large extent complementary. "The urban transportation problem is in reality several different problems that vary in time and space. The advantages and disadvantages of public carrier and automobile transportation vary according to these differing circumstances" (p. 163). On the one hand, he concludes that on the basis of relative cost and service characteristics "travel requirements and consumer choice will continue to favor the automobile" (p. 163), and that "in general the problem is motor transportation, and increasingly automobile rather than public carrier transportation. Neither economic analysis nor transportation history suggests a return to public transportation on a scale that would be decisive" (pp. 252–53). However, public carriers will "continue to be an essential part of the transportation system in large metropolitan areas. . . . The principal task of transit will be to absorb home-to-work travel peaks. . . . Public transportation will continue to play an important role in the older central business districts, and along high-den-

sity, home-to-work travel routes close to the center. In these circumstances, the limited capacity of downtown highway and parking facilities in major cities will continue to make extensive use of the automobile impossible at the peak" (p. 253). For mass transit, busses operating in separate lanes on controlled-access expressways are favored against rail facilities. "The bus avoids the high cost of an exclusive right-of-way, and it can serve essentially the same transportation patterns established by the automobile" (pp. 253–54).

With respect to the question of financing urban transportation the key issue is said to be that of subsidy versus self-support. The latter alternative is favored, primarily on the ground that municipalities usually do not have the resources to support transit out of general tax revenue and secondarily because user charges can serve to control the character and amount of transportation service demanded. Owen favors revision of transit fares so as to secure more adequate revenue from long-haul and peak-hour riders; higher parking charges to control downtown congestion; and the use of toll financing on urban expressways, both to insure revenues sufficient to provide the necessary facilities and to minimize nonessential peak-hour traffic. The interesting suggestion is made that the revenues from all forms of urban transportation be pooled and that a portion of the highway revenues be used to support improved peak-hour transit service, on the ground that the standby costs of the transit system should be borne at least in part by automobile users who resort to transit facilities only occasionally and at peak periods. Concluding chapters point out the need for unified control of all forms of urban transit, for areas of authority coterminous with metropolitan areas, and for community planning to check both overconcentration of population in urban centers and the excessive sprawl in suburbs which has created slums and blighted areas. The relevance of this last point to national defense is also discussed.

The volume contains a number of excellent photographs and there is also an appendix containing a comprehensive collection of statistical material, some of which is not easily accessible elsewhere. On the other hand, there is no bibliography, and the numerous footnote references fail to include the information which would enable interested readers to secure items not obtainable through ordinary channels.

This is a well-written, timely, and important study which should prove to be of great interest to students of transportation and of city planning, and to many laymen as well.

Robert W. Harbeson

University of Illinois

Public Control of Economic Enterprise. By Harold Koontz and Richard W. Gable. (New York: McGraw-Hill. 1956. Pp. xii, 851. $7.00.)

The authors of this book describe and analyze all aspects of governmental economic regulation in the United States, not only the traditional regulation familiar in the transportation and public utility industries and in the enforcement of the antitrust laws, but also governmental action to supervise banks and investment trusts, to establish standards for security issues

and security and commodity exchanges, to influence the labor bargain, to aid business and agriculture, to promote economic stability, and even to manage the economy in war emergencies.

Government intervention in economic affairs is warranted, according to the authors, when it increases total economic freedom or serves to safeguard the functioning of the economy, as with respect to full employment, stable prosperity, and national defense. *Public Control of Economic Enterprise* deals with the "rationale, legal bases, techniques and effects of control, with as much attention as possible to the broader implications of control" in each of the areas of government intervention which the authors discuss.

Transportation, public utilities, antitrust enforcement, and labor are given somewhat fuller historical and topical treatment than is accorded to the other areas of control. The transportation section begins with a survey of the development of patterns of control and thereafter examines the regulation of rates, service, labor, finance, and combinations. This section deals primarily with the railroads, but some attention is also given to trucks, the airlines, and water carriers. A very useful chapter reviews recent critiques of our national transportation policy, especially with respect to inconsistencies between regulation and promotion, the proper role of competition in a regulated industry, and management's opportunities to achieve efficiency. The pros and cons of such fundamental policy recommendations as regional transportation monopolies are weighed, but the authors offer no personal solution for the transportation problem.

While transportation regulation illustrates the pre-eminence of federal control, the regulation of public utilities shows a pattern of state regulation supplemented and supported by federal controls. "The results of public-utility rate regulation have been somewhat better than the results of regulating carrier rates, if the financial stability of the operating companies is used as the measure." But the authors question the propriety of this measure in view of the noncompetitive status of public utility companies.

Maintaining competition presents four aspects of monopoly and the antitrust problem—the decline of competition, attacks upon monopoly and restraints of trade, regulation of competitive practices, and special areas of trade regulation. The chapter on this last aspect gives attention to trade associations, resale price maintenance, patents and copyrights, basing-point pricing, and competitive practices relating to foods, drugs and cosmetics. The evidence of a decline in competition is, in general, well illustrated, but space does not permit a development of the circumstances under which the enumerated restraints impair competition. The discussion of the attack upon monopoly and restraints and the regulation of competitive practices is necessarily developed in terms of leading court cases. The cases selected are appropriate, but their compressed presentation allows little scope for examining the multiple economic and competitive issues which arise in even the simpler cases. Incidentally, the Federal Trade Commission has not yet had an opportunity to rule on the legality of Pillsbury Mills' acquisitions of Ballard & Ballard and the Duff Baking Mix Division of American Home Foods, and the action of the Department of Justice relative to the proposed merger of Bethlehem Steel Corporation and Youngs-

town Sheet & Tube Company was only an informal advisory opinion (p. 369).

The chapters on government regulation of banks, security issues, and security and commodity exchanges offer primarily analyses of evolving legislative patterns.

The discussion of government controls in the labor field is one of the strongest sections of the book, dealing with such matters as child labor, fair employment practices, wage and hour regulations, state and federal, health and safety regulation, unemployment insurance, collective bargaining, and regulation of management and labor relations. There are good discussions of the social and economic problems of labor and good appraisals of public policy in relation thereto.

A discussion of General Aids to Business, in addition to making reference to basic legal and monetary institutions, considers special services to particular industries (shipping, mining, etc.) and financial aids in the form of tariffs, credits, and subsidies. The historical review of government aids to agriculture undertakes no extended excursion into the economics of the farm problem. Government ownership of business is discussed in relation to the more important federal, state and local enterprises and the advantages and disadvantages, in this area of perennial debate, are impartially marshalled. The authors have performed a very useful service in showing how the government corporation, which was developed to provide responsible management for public undertakings, has, in the federal field, been reduced to general impotence by successive legislative restrictions.

Wartime controls and the Employment Act of 1946 provide the basis for a suggestive consideration of the general problems of over-all government management of the national economy.

Public Control of Economic Enterprise offers for the college course in the economics of government regulation a comprehensive coverage of broad and diverse fields, a good historical perspective for the American scene, and a balanced consideration of the policy issues inherent in government action in economic affairs. Because the field is so vast, both in extent and in depth, all-inclusive textbook treatment, even where analytical, raises fundamental questions about our teaching of economics. Is it possible to give students meaningful training in economic analysis through the medium of complex cases discussed in a sentence or in a paragraph? Does public economic regulation conform to such principles and standards as to provide a unifying factor in these diverse economic areas, such as justifies confining students to other peoples' thoughts, or should students in such controversial areas be compelled to analyze problems for themselves and to arrive at their own judgments, even though these judgments be imperfect? Would the would-be economists mature more certainly and more surely if exposed to larger doses of the complex problems in particular areas of government intervention in economic affairs? The very fact that the authors have fulfilled their assignment skillfully and comprehensively makes the reader aware that perhaps the assignment—and the teaching needs which it serves—should be re-examined.

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Land Economics; Agricultural Economics; Economic Geography; Housing

Resource Productivity, Returns to Scale, and Farm Size. Edited by E. O. HEADY, G. L. JOHNSON, and L. S. HARDIN. (Ames: Iowa State College Press. 1956. Pp. xi, 208. $3.50.)

Covering some 200 lithoprinted pages, this book contains the proceedings of a conference called by the North Central Farm Management Research Committee on Farm Scale and Resource Productivity in Chicago, October 19 and 20, 1954. Twenty-five authors contributed two introductions, 22 papers, and 7 discussions.

Primary emphasis is on the estimation of production functions (usually Cobb-Douglas) and their subsequent use in farm budgeting, linear programming, estimating marginal productivity and elasticity coefficients, determining optimum size of farm firms, and comparing actual with optimal farm organization. Topics covered include relevant aspects of economic theory, problems arising from managerial processes, institutional considerations, the selection of algebraic form of function, some sampling considerations, the specification of statistical model (single equation *vs.* simultaneous equations), and tests of significance.

Additional topics include some history of farm budgeting in the United States, research in farm size based on farm records and surveys, and a small section on individual and group values in farm management analysis.

The stated objective of this publication is "to review some of the current thinking and research in the measurement of resource productivity in farm production" and "to stimulate and aid productive thinking and research in this increasingly important area." It has achieved its first objective and is likely to achieve the second, also. Much of the material presented, particularly by Heady and Johnson, is a restatement of material already available in their previous publications. This repetition was necessary, however, for the book to reflect "current thinking and research" in this area. On the other hand, a few papers present new techniques and variations of old techniques that have not been published previously.

The pages-per-article ratio of 6.5 already indicates that many topics are not adequately covered. Probably it is unfair to single out the eight-page chapter on the use of simultaneous equations to estimate production functions. The author would have been better advised to use the space allocated to him to explore more fully the relationships between the single-equation and simultaneous-equation approach and the conditions which make the former a special case of the latter rather than to introduce the technical jargon associated with computational details. That such an exploration was needed is illustrated by the following chapter which seems to imply that the simultaneous-equation method should only be considered (and then rejected) for multiple-enterprise farms.

Fortunately, here as well as elsewhere in the book, brief treatment is partially compensated by extensive useful references. Many readers will be stimulated by these appetizers to stay for dinner. An additional important

reference in the area of simultaneous equations is *A Statistical Study of Livestock Production and Marketing* by Clifford Hildreth and F. G. Jarrett.

Several statistical procedures are illustrated or proposed with insufficient logical justification. On page 75, Heady derives what seem to be confidence-interval estimates of total returns from conservation (beyond those currently attained) as a function of total capital investment. His method is to replace regression coefficients in the estimated function by their "upper and lower fiducial limits at a 5-per cent level of probability." The constant term, on the other hand, is not treated as a random variable, and the covariance between regression coefficients is ignored.

On page 95, Johnson proposes that "purposive sampling" be used, that farms be selected "in such a way that the intercorrelations in the factor-factor dimensions are as near zero as possible and to maximize the variances in the factor dimensions. . . . " While it is true that stratification is a useful tool in developing more powerful estimating procedures, this does not mean that random sampling within strata is no longer advisable.

JAMES N. BOLES

University of California, Berkeley

Labor Economics

Cross Purposes in Wage Policy. By R. G. HAWTREY. (London and New York: Longmans, Green and Co. 1955. Pp. x, 148. 7*s* 6*d*.)

Mr. Hawtrey's book is close to being a popular presentation of the problems of monetary and wage policy in postwar Britain, although much of what he says has a general relevancy. The analysis is sensitive and subtle, at the same time eschewing theoretical detail, and the conclusions emerge with clarity. As one might expect the presentation is a stylistic model, but as one might not expect the book is presented in inexpensive paper-bound form.

The author's central point is that wage policy cannot be considered in a vacuum. Wage policy, domestic monetary policy, fiscal policy, and foreign exchange rates are all interdependent. The nature of their interdependence is unraveled in a critical account of British postwar policies in these areas. While British wage policies of the time receive their share of adverse comment, the principal barbs of the book are directed toward the monetary policies, defined broadly, that made those wage policies possible and even encouraged their adoption.

Hawtrey argues that the British devaluation in 1949 was really unnecessary in that British prices were already sufficiently low. Although domestic wages had risen, despite official exhortations, the compensating effect of the increase in American wages was overlooked. The devaluation accentuated overemployment, which rigorous monetary policy and less inflationary government borrowing would have restrained.

Devaluation, however, was followed by domestic wage increases which would have corrected the disequilibrium implicit in the new exchange rate had not American wages been rising at the time. Government, trade-union,

and arbitration officials have all attempted to hold down wages but, in the face of rank-and-file pressure, were effective mainly in 1949 only. The pressure for higher wages will continue as long as monetary policy encourages an expanding money supply.

The 1949 devaluation committed the country to substantial wage and price increases, made all the greater by subsequent price rises in America. Lax credit policy failed to restrain these increases and excess government spending added to them.

> . . . monetary policy and fiscal policy combined could put an end to the pressure for rising wages which excess spending causes. Delicate handling would be needed to keep the middle path of full employment and to avoid any lapse either into inflationary over-employment or into deflationary unemployment. (Pp. 131–32.)

Wage policy is thus viewed as essentially secondary to, *i.e.*, made in a framework of, monetary and fiscal policy.

As part of the development of his main theme Hawtrey makes a number of interesting observations on such questions as wages under competition, the cost of living and wages, wages and productivity, equal pay for equal work, etc. A very complete index is provided.

FRANCIS S. DOODY

Boston University

Labor's Wage Policies in the Twentieth Century. By JAMES S. YOUTSLER. (New York: Twayne Publishers, for Skidmore College. 1956. Pp. 344. $5.00.)

This study is a further contribution to the growing literature on wage determination. The author sides with those economists who resist the effort to explain wages mainly in terms of conventional economic theory, and who prefer to approach the subject through the study of institutional behavior. He has chosen for his research a re-examination of trade union wage demands and of the institutional factors which have had some influence in their formulation. Although the study touches on a broad range of trade-union interests, the author's primary concern is to call attention to the social and ethical considerations which affect trade-union wage behavior, and in particular to stress the influence of the "role of need."

The book is divided into five parts. The first is a short and critical review of conventional wage theories. The second and third parts are devoted to a chronological study of labor's wage demands from 1900 to 1930, and of the wage policies of the American Federation of Labor and the Congress of Industrial Organizations from 1930 to 1953. The fourth and most substantial part of the work is a review of the wage history of a number of AFL and CIO affiliated unions[1] from the time of their inception to the present.

[1] The unions whose policies are described are the following: International Ladies' Garment Workers' Union; The Amalgamated Clothing Workers of America; International Brotherhood of Pulp, Sulphite and Paper Mill Workers and International Brotherhood of Paper Makers; United Steelworkers of America; International Union, United Automobile, Aircraft and Agricultural Implement Workers of America; The Textile Workers Union of America; United Electrical, Radio and Machine Workers of America; and International Union of Electrical, Radio and Machine Workers.

In the course of his work, the author has assembled a very substantial body of data drawn from many sources. The descriptions of labor's demands have been painstakingly culled from trade union publications and convention proceedings, arbitration and mediation decisions, and the records of collective bargaining negotiations. The author has also drawn on the findings of many of the more prominent investigators in the field, such as Dunlop, Millis and Montgomery, Ross, Levinson, Slichter, and Shultz and Myers, and has included a considerable amount of statistical material relating to wage rates, real earnings, and the extent to which workers have shared in productivity and national income.

The author has given a detailed and interesting account of trade-union wage strategy in the face of changing circumstances. He has included under wage policy not only the unions' striving for higher wages, but also the attempts to secure shorter hours, to stabilize wage conditions, to set suitable wage standards, to extend fringe benefits, to achieve greater "industrial democracy" through collective bargaining and union-management cooperation, and to further the movement's social objectives through legislation. The policies of the AFL and CIO are set forth against the background of broad economic and social change and reveal the extent to which these bodies are concerned with over-all issues. The policies of the individual unions, on the other hand, are shown to be more responsive to conditions in their respective industries.

The author has also included his views on a number of important questions suggested by his materials. On the debatable subject of whether trade unions have succeeded in raising real earnings for their membership, the author argues that the stronger unions have had an important influence. It is also the author's opinion that trade union activities taken as a whole have not adversely affected prices or employment, although he acknowledges that the gains of organized labor since 1946 may mave been partly at the expense of fixed-income groups. The union wage policy of equalization of wages on an industry-wide or regional basis is considered by the author as a step leading to increased union-management cooperation. The author also discusses the implications of the guaranteed wage from the point of view of its likely impact on the worker and the labor movement, the employer and the economy.

The descriptive material is well presented, but in the reviewer's opinion the author does less well with his analysis. Of the many factors which have influenced trade-union decisions on wages, the emphasis throughout is on the workers' "need." Unfortunately, the concept of need is nowhere defined, and the author's criteria of need seem to merge with more abstract considerations of what is a fair and equitable share. Moreover, while the data is highly suggestive that unions do give consideration in their demands to factors of workers' need, cost of living, and a more equitable sharing in national income, the author gives no clue as to how the influence of these factors can be evaluated. The reader is left to weigh the evidence for himself, and to draw his own conclusions.

Although the book raises many interesting problems, it is essentially a survey. The author summarizes his materials skilfully, and has applied his

critical judgment to a number of important questions. The author himself finds, however, that the "amorphous mass of material and the length of the period covered in the study" make it difficult to present conclusions. The reviewer sympathizes with the author's dilemma, but cannot help regretting the absence of a more well-defined analytical framework.

AARON W. WARNER

Columbia University

Emergency Disputes and National Policy. Edited by IRVING BERNSTEIN, HAROLD L. ENARSON and R. W. FLEMING. (New York: Harper and Bros. 1955. Pp. xi, 271. $3.50.)

The fifteenth in a series of the Industrial Relations Research Association publications, this book was written some eight years after the enactment of the National Labor Relations Act of 1947. This law, with its controversial Title II, National Emergency Provisions, came into being some two years after the 1945-46 postwar strike wave. Because of the cooling-off effect made possible by these intervening years, as well as by the almost assured unity of the American Federation of Labor and the Congress of Industrial Organizations, this dynamic study came into being at a most opportune time.

In their introduction, the editors define a national emergency dispute issue as "A nation-wide and industry-wide stoppage in a basic industry" which may "shut off goods or services vital to the health and safety of millions of people." Despite this easily formulated definition, the editors are quick to point out that the "emergency problem provides an arena for a set of irreconcilable convictions" and "like most great policy questions in a democratic society, it is more readily framed than resolved." This is an agreement to disagree, and seems to be the only thread of general concurrence that is reiterated in each of the fifteen chapters, each one written by an expert, and each on one or the other side of the fence, or even perched comfortably right on top.

The first part of the book, which is divided into three parts, answers the question, What is a national emergency dispute? G. H. Hildebrand discusses "An Economic Definition of the National Emergency Dispute," in which he analyzes the industries which now have—or haven't—a potential to fall into this emergency category. Despite certain qualifications, he concludes that "optimism about the relatively small dimensions of the problem of national emergency strikes still seems warranted for the present period. . . . " Irving Bernstein, who writes about the "Economic Impact of Strikes in Key Industries," notes that "only three of fifty-one highly unionized industries in the United States have a national emergency potential: coal, steel, and railroads" and that the "results leave little doubt that the national emergency problem, in so far as it is economic in character, has been much exaggerated." H. L. Enarson, who describes in detail the steel strike of 1952, indicates that there is more than the economic side to an emergency dispute, by detailing the political and public-opinion aspects of the problem. Benjamin Aaron concludes the first part of the book by

disposing of the widely held misconception that such a dispute is a challenge to the authority of either the government or of other groups.

Four authorities discuss the experience under the emergency provisions of the Taft-Hartley Law in the second part of the book. F. M. Kleiler examines the "troubled industrial relations in the years immediately preceding 1947." A. J. Goldberg and Jack Barbash, who describe how labor views the national emergency provisions, give certain criteria of values and techniques, in the light of which they indicate their own approach to the emergency problem. A. R. Heron, while insisting that there "is no such thing as an industry view," gives certain criteria as the basis for his conclusion that "it is probable that most people in management look favorably on the present emergency provision." F. C. Pierson elaborately evaluates the national emergency provisions and proposes certain changes, but concludes that "the crux of the matter is the spirit in which the law is administered."

The concluding section of the book discusses the elements of a national policy. W. W. Wirtz, who discusses a wide choice of procedures for a solution of the problem, urges the establishment of "a pattern for flexible approach to emergency," rather than "a single invariable set of compulsions." J. K. Mann describes the "special disputes machinery devised for the atomic energy field" and examines "its present relation to generalized national labor policy." R. W. Fleming, in his "Search for A Formula," discusses as proposals for the handling of emergency strikes the statutory strike, compulsory arbitration, and two specific situations, the pattern under the Virginia and Massachusetts laws, and emergency panels for specific industries. Archibald Cox describes experience with seizure in emergency disputes, and in appraising its future possibilities concludes that "seizure alone would seldom be an effective solution" but that "it appears to have considerable psychological value." Murray Edelman concludes this section as well as this most valuable book by discussing the part to be played by the different branches of government, executive, legislative, and judicial. In Appendix A, C. M. Rehmus discusses the twelve occasions in which the emergency machinery had been evoked up to the time of the writing of the book. Appendix B reproduces Title II of the National Labor Relations (Taft-Hartley) Act of 1947. These are very definite assets of the book.

This volume is a valuable contribution towards the formulation of a more applicable and widely accepted labor policy.

C. MORRIS HOROWITZ

Brooklyn College

Lohnhöhe und Beschäftigung. By WILHELM KRELLE and HEINZ HALLER. (Berlin: Duncker & Humblot. 1955. Pp. 79. DM 6,60.)

In this, the eleventh of a series of economic studies issued since 1949 under the aegis of the *Theoretische Ausschuss des Vereins für Sozialpolitik* (Theory Committee of the Society for Social Policy), two of modern Germany's outstanding academic economists present somewhat contrasting, yet complemetary essays in wage theory. This slim volume also contains

the essence of the discussions provoked by the reading of these essays at two committee meetings, in January 1953 and September 1954.

In the first of the essays, Wilhelm Krelle is concerned with the influence of wage changes on prices and employment in the individual firm. An almost nostalgic reference to an earlier state of theory in which all such questions seemed settled by application of the marginal analysis of J. B. Clark and Böhm-Bawerk, correctly sets the stage for what follows. Essentially, despite protestations to the contrary, Krelle's contribution represents a modernization of an old methdology. In answering such questions as the impact of wage changes in a firm upon employment in that firm, upon the price of the end-product, upon factor prices, or upon the prices of substitute and complementary products, his major departures from neoclassic doctrine are the introduction of many more variables and the replacement of the simpler mathematical techniques of incremental analysis and simple geometry with more sophisticated models utilizing differential calculus and modern geometry. Aside from the aesthetic satisfaction provided scholars, however, Krelle's contribution is as arid for decision-making in the firm, at least from a positive point of view, as that of J. B. Clark. In this, Krelle's performance is no different from that of many American model-builders whose stochastic equations offer mental exercise but no guides to policy. His conclusion, in agreement with Arthur Ross and Clark Kerr, that there is no symmetry in the operation of a particular wage change, is supported by his mathematical demonstration. However, a more logical case for the same conclusion is made by Lloyd Reynolds in his textbook, *Labor Economics and Labor Relations* with less elegance but more persuasion.

Of greater value is Krelle's argument that the theoretical apparatus to date, because of its static nature, can offer only a means of obtaining a determinate answer to the why of what already has happened. The prediction of consequences of a wage change under specified circumstances, according to him, will have to await the evolution of a dynamic theoretical apparatus.

In contrast with the rigorous development and narrower focus of Krelle's paper, that of Heinz Haller is philosophical, discursive and broad. No attempt is made by Haller to present theorems, principles or laws. Instead, he is concerned that economists take into account the realities that they too often have treated as temporary frictions. No effort is wasted in the construction of an incomplete model of the wage-employment relationship. Recognizing that timber must be transformed to lumber before a house may be built, Haller shapes a number of planks for use by examining persistent features of contemporary economic life which affect wage-setting and which determine the reactions of the economy to the wage levels set.

Woven into the discussion are numerous interesting comments on various aspects of the work of Keynes, Lange, Patinkin, Pigou and Hansen among others. These comments, as well as an unashamedly partisan argument for a doctrine of "social partnership" in industrial relations, are given as much prominence as any attempt to contribute to wage-employment theory. As a result, Haller's essay merits attention more as a critique of ex-

tant theory from a special point of view than as a contribution to economic theory.

On the whole, this publication, as well as the others in the series issued under the same auspices, should prove of particular interest to readers familiar with that trend in German economic thought, temporarily arrested in the Third Reich, which reflected the effort to give a broader social base to theory and thereby influence public policy. These publications represent the renaissance of the tradition of the seemingly dissimilar yet basically associated social-policy approach of F. C. Müller-Lyer, Fritz Karl Mann, Wilhelm Lexis and the like, and are indicative of a resurgence of German economic humanism.

LOUIS R. SALKEVER

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Industrial Relations in Australia. By KENNETH F. WALKER. (Cambridge: Harvard University Press. 1956. Pp. xviii, 375. $7.50.)

Interest in labor management relations in Australia has understandably been focused on its unusual sixty years experience with compulsory arbitration. Has this system protected the community against economic loss and inconvenience resulting from strikes? Has it contributed to productivity? What effect has it had on the unskilled and "least-well-off" workers?

Kenneth F. Walker, professor of psychology at the University of Western Australia, with ten years' practical experience in the Australian Deparment of Labour and National Service, examines the social, economic, technological, and political factors involved in this bold experiment. His book is an informative, well-written and up-to-date addition to the considerable list of books and articles on the subject.[1]

Case studies of seven industries—furniture, metal mining, meat slaughtering, coal mining, sheep raising, metal trades and stevedoring—comprise a major portion of the book and illustrate the varied pattern of industrial relations under a system of compulsory arbitration. For example, work stoppages are nonexistent in furniture but severe and frequent in coal mining and stevedoring. Mutual acceptance by union and employers is complete in metal trades and sheep raising but absent in stevedoring and coal mining. The role of an industrial tribunal is continuously important in meat slaughtering and coal mining, vital in sheep raising, important in stevedoring and of little importance in furniture and metal trades.

Walker suggests nine proximate determinants for this varied pattern: (a) effectiveness of direct action; (b) extent to which the union attempts to penetrate managerial functions; (c) stability of organization among employers and employees; (d) nature of the work and circumstances of employment; (e) economic horizon of employees; (f) methods of management;

[1] For a recent bibliography see D. W. Oxnam, "Industrial Arbitration in Australia: Its Effects on Wages and Unions," *Indus. Lab. Rel. Rev.*, July 1956, IX, 610–28.

(g) common social and industrial background and interests of employers and employees; (h) personalities of union leaders, management and employers' association staff; and (i) ideological and political objectives.

The analysis, despite Walker's expertness and capability, suffers from vagueness. He has endeavored to view industrial relations as the interaction of a system of forces operating in a social framework at a particular time and place. Unfortunately the methods of measurement available for the interdisciplinary approach involving all of the social sciences are still inexact and the tools of investigation are blunt. Walker recognizes the importance of testing the strength of the various forces and their functional relationships, but the means available are inadequate to the challenge. His major generalization, however, may turn into a scientific bonanza. He concludes that the problems of productivity and work stoppages might be more carefully delineated by a complete knowledge of the market conditions and technology of various industries.

Despite the very general nature of the results from existing and primitive tools of analysis, Walker's book supplements the information available from other sources. Compulsory arbitration in Australia has been a stimulus to the organization and improvement of working conditions of poorer workers. Strikes are frequent but short. Australia has an unusual proportion of activities that are centers of conflict the world over, particularly in coal mining and water transportation. Real wages have paralleled productivity, although cause and effect are not ascertainable. The influence of strong unionization and a labor party are still imponderables.

Walker's study was not intended to arrive at a conclusion as to whether the United States should adopt compulsory arbitration. Yet the question inevitably comes to mind in the light of this most recent full investigation in another country. Today, nine out of ten union agreements in this country provide for some form of arbitration. Should these arrangements be formalized and made applicable to all? The general consensus of American experts appears to be that compulsion would not work here. When arbitration was made compulsory in Kansas in the 1920's it failed; both unions and employers opposed the law and the United States Supreme Court held the law unconstitutional.

MAXINE YAPLE WOOLSTON

Bryn Mawr College

Population; Welfare Programs; Standards of Living

Social Security and Public Policy. By EVELINE M. BURNS (New York: McGraw-Hill. 1956. Pp. xvi, 291. $5.50.)

The main problems of a social security program can be stated very briefly. Granted the policy objective of providing a minimum standard of living for all citizens, the following questions have to be put: What should this minimum be? Should state action be confined to helping individuals themselves to reach this minimum by some redistributory device, *e.g.* full employment, or should it extend to state provision of social services?

Granted state intervention, how should it be financed? How far will particular methods of finance conform or conflict with other government policy objectives? Professor Burns has not provided her own answers to these questions, but she has ably summarized and discussed the answers provided by administrators, businesses and trade unions, and economists, not only in the United States, but in a considerable number of other countries with widely differing social security programs. The result is a first-rate and exceedingly readable text aimed at the intelligent student; in fact, it is the only general textbook of its kind, and it is a welcome relief to find such a book among the host of dreary summaries of the history of social security legislation which pass for inclusion in academic courses.

The book is divided into four parts. In the first part, the author considers what problems arise in fixing the rate of social security benefits and what conditions should govern their receipt. Obviously these problems will be solved in very different ways in different economies, depending on the amount and distribution of real income, the prevailing causes of poverty, and the social attitudes of the public to these conditions. "Solved," however, is hardly the right word, as is clear from Mrs. Burns' particularly enlightening chapter on income guarantees and the willingness to work, because the solutions are hampered by the peculiar difficulty of defining fundamental concepts, such as "need," "eligibility" and "malingering." How right she is to stress the lack of precise information about the effects of social security on economic incentives, and the need for continuous research, granted the ever-changing economic conditions in which social security programs are bound to operate.

Part II of the book brings us to the consideration of the sources of income inadequacy and the forms of state intervention used to prevent poverty. Always the general issues are put before the reader, and he should be particularly impressed by the author's restrained treatment of the problems encountered in instituting a public medical service. The reviewer notes with satisfaction the parallel drawn on page 133 between the veteran's health program in the United States and the hospital service in the United Kingdom!

Part III, on the financing of social security programs, contains some shrewd analysis of the inevitable conflicts which arise between social-security aims and other government policies. To many foreign readers the sections on the economics of experience-rating and the problems of inter-governmental cost-sharing will be of particular interest, while the discussion of the perennial questions of insurance taxation (for so it must be regarded) and of reserve *vs.* current financing will provide a useful link between a course on social security and one on the economics of public finance. The reviewer did find that Mrs. Burns' eclectic approach served her less well in the discussion of the incidence of social security taxes. It would have been useful to have distinguished between short- and long-run incidence of these taxes, and to have said something of the difficulties of arriving at any general conclusions which are independent of the particular budgetary assumptions made. The reviewer would also have liked to have

seen some discussion of the economic problems facing social security schemes in countries with ageing populations. The work concludes with a short section on the administrative problems of social security.

It only remains for the reviewer to congratulate the author for producing a work which will attract the student to a neglected but important aspect of applied economics.

ALAN T. PEACOCK

University of Edinburgh

American Social Legislation. By JOHN D. HOGAN and FRANCIS A. J. IANNI. (New York: Harper & Bros. 1956. Pp. xvi, 713. $6.50.)

The role of social legislation in promoting the well-being of both society and the individual has been obscured by the continuous controversies as to the wisdom and desirability of certain legislative measures and their implementation. Social legislation is often the result of social change. It is, however, also a producer of important social changes. In this latter respect it serves as a catalytic agent. The authors of this interesting work (also designed as a text) skillfully present a subject of vast import to the United States. Indeed, it would be no exaggeration to state that from the cradle to the grave the average American is now enwrapped in a thick layer of social legislation aimed at protecting him from the vicissitudes of a complex industrial civilization.

Against the background of an analysis of the American social system, social thought and social movements, the authors devote a substantial portion of the book to problems arising from the growing dependence of the average employee. This results from an industrial process which is ever mutable, whose tempo is ever accelerating, and which shows no signs of slackening in the near future. A product of thorough research, the work devotes a great deal of attention to such topics as income security, social insurance and assistance, and labor legislation. It also traces the changing trends in family legislation, including that concerned with marital and parent-child relationships. From the abundant materials made available to the reader, one gains the impression that part of American social legislation is of high quality but that the remainder is characterized by overlapping, confusion, and illogicality.

Although the authors cover their material comprehensively, one noticeable gap concerns the relating of laws to the experience which led up to their passage. In all fairness to Hogan and Ianni, full coverage of this aspect would have required tremendous research. Nevertheless, the authors may not have made full use of available sources of information that shed light on the motivations, pressures, and causes accounting for the passage of specific acts of social legislation. As J. Owen Stalson, in his *Marketing Life Insurance*, has pointed out (p. 314), "laws are generally produced as the result of some immediate agitation by an interested group—those who have been injured, those who seek to create a situation from which they may profit" and by other groups. These other groups include those inspired by humanitarian and altruistic considerations.

Another serious gap is the failure of the authors to analyze the costs of American social legislation. Revenues and expenditures cannot be ignored in evaluating the wisdom of specific measures of social legislation. Are costs rising? What proportion of governmental revenues are devoted to the administration of social legislation? How much more can the taxpayer bear? Is there any limit in sight? The book undoubtedly would have profited from a consideration, in more or less detail, of this growing problem of costs.

On the whole, the work fills the void of textbook material in a field which is fraught with enormous significance for the welfare of the ordinary American. The volume, written in interesting fashion and effective style, should serve as an useful introduction to those interested in pursuing further research in this area.

HARRIS PROSCHANSKY

New York, N. Y.

TITLES OF NEW BOOKS

Descriptive notes accompanying some of the following titles have been prepared by Professor I. L. Sharfman, of the University of Michigan.

General Economics; Methodology

BARRE, R. *Économie politique.* Vol. II. (Paris: Presses Univ. de France. 1956. Pp. 768. 1.660 fr.)

A text prepared specifically for the use of students in *Instituts d'Études Politiques* and candidates for *la licence en droit.* The present volume is concerned with the subject of distribution—in general, in a decentralized capitalistic economy, and in a centralized collectivist economy. The first volume, by André Marchal, appeared earlier this year; but it has not been received.

BILLY, J. *La politique économique.* (Paris: Presses Univ. de France. 1956. Pp. 128.)

BLADEN, V. W. *An introduction to political economy.* Rev. ed. (Toronto: Univ. of Toronto Press. 1956. Pp. viii, 319. $4.95.)

BYE, R. T. AND BARNES, R. R. *Questions and workbook for Bye's "Principles of economics."* 5th ed. (New York: Appleton-Century-Crofts. 1956. Pp. v, 310. $2.75.)

EASTHAM, J. K., ed. *Economic essays in commemoration of the Dundee School of Economics.* (London: Economists' Bookshop, Ltd., distrib. 1955. Pp. 103.)

HALL, E. W. *Modern science and human values—a study in the history of ideas.* (New York: Van Nostrand. 1956. Pp. x, 483. $8.)

"In tracing the achievement of modern scientific method, material has been drawn largely from the histories of dynamics and economics. It was thought wise to take a physical and a social science, and the actual choice in each area was dictated largely by the fact that it was in the chosen disciplines that the new method found its earliest attainment." (From the introduction.)

KNORR, K. *The war potential of nations.* (Princeton: Princeton Univ. Press, for Center of Internat. Stud. 1956. Pp. viii, 310. $5.)

"As a contribution to a theory of war potential, this book intends to explore and clarify the underlying bases of military power, to facilitate estimates of the comparative war potential of nations, and to identify some of the conditions which nations can manipulate in order to bolster their war potential.

"The study is not restricted to economic or industrial war potential. The determinants of potential military power are divided into three broad categories: The Will to Fight, usually called 'morale'; Administrative Capacity; and Economic Capacity. . . . an attempt is made to show how these determinants of war potential interact." (From the introductory chapter.)

KOIVISTO, W. A. *Principles and problems of modern economics.* With *Instructor's manual.* (New York: John Wiley. London: Chapman & Hall. 1957. Pp. xxi, 834. $6.)

MUNBY, D. L. *Christianity and economic problems.* (New York: St. Martin's. London: Macmillan. 1956. Pp. ix, 290. $5.)

PAULSEN, A. *Allgemeine volkswirtschaftslehre.* Vol. I, *Grundlegung, Wirtschaftskreislauf.* (Berlin: Walter de Gruyter. 1956. Pp. 138.)

WHITTAKER, E. *Economic analysis.* (New York: John Wiley. London: Chapman & Hall. 1956. Pp. xiii, 460. $6.50.)

Price and Allocation Theory; Income and Employment Theory; Related Empirical Studies; History of Economic Thought

BIET, B. *Théories contemporaines du profit—essai de micro et macroanalyses.* (Paris: Lib. de Médicis. 1956. Pp. 302. 1.500 fr.)

CARLSON, S. *A study on the pure theory of production.* Reprint of Econ. classics ser. (New York: Kelley & Millman. 1956. Pp. vii, 128. $4.50.)

EISERMANN, G. *Die Grundlagen des Historismus in der deutschen National- ökonomie.* (Stuttgart: Ferdinand Enke. 1956. Pp. xv, 249. DM 25,—.)

FANNO, M. *La teoria delle fluttuazioni economiche.* 2nd rev. ed. (Turin: Unione Tipografico-Ed. Torinese. 1956. Pp. xv, 487. L. 3.800.)

GEHRIG, H. *Friedrich List—und Deutschlands politisch-ökonomische einheit.* (Leipzig: Koehler & Amelang. 1956. Pp. 450.)

JAMES, E. *Histoire sommaire de la pensée économique.* (Paris: Montchrestien. 1956. Pp. 336. 1.320 fr.)

KENDRICK, J. W. *Productivity trends—capital and labor.* (New York: Nat. Bur. Econ. Research. 1956. Pp. 23. 50¢.)

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This study, prepared by a British consulting social-analyst on the basis of his experience since late in 1952 with the Glacier Metal Company, a London engineering factory, concerns itself with the problem of "how to determine the appropriate payment and status for individ-

uals for the work they do." It propounds the theory that the level of responsibility attaching to the holder of any job is centered in the discretion which the individual must exercise therein; that this level of responsibility can be measured with reasonable precision and objectivity; that the maximum span of time during which individuals are required to rely upon their own discretion without having their judgments subjected to review provides such measurement; that the time-span of discretion constitutes the controlling basis of wage and salary demands, irrespective of the type of work involved; that the recurrence of payment disputes springs from departures from this underlying but unrecognized element in the wage and salary structure; and that the instant analysis "might be considered to suggest a possible route towards a systematic pattern of financial reward in relation to the level of work done." While the study reflects a helpful blending of theoretical insight and practical detail, it is submitted by the author as "an interim report," supplementing the earlier and more general report, prepared by the same author and dealing with the same company, which was published as *The Changing Culture of a Factory* (London: Tavistock Publications, 1951).

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This impressive book, with its thoroughgoing theoretical analysis and its large mass of empirical data, encompasses both less and more than its principle title, as set forth above, might suggest. Its subtitle, *The Internal Politics of the International Typographical Union*, specifies expressly that it is a case study of a single trade union; but at the same time its avowed purpose is to explore the factors which impair or support democratic processes not only in all labor unions but in private organizations of all types. The problem of the distribution of power as between such organizations and their members—with the wide acceptance of the so-called "iron law of oligarchy," as developed by the German sociologist Robert Michels, in his *Political Parties*, originally published in 1911—is common to all voluntary associations. "In few areas of political life," it is asserted, "is the discrepancy between the formal juridical guarantees of democratic procedure and the actual practice of oligarchic rule so marked as in private or voluntary organizations such as trade unions, professional and business associations, veterans' groups, and cooperatives. In fact, . . . almost all such organizations are characterized internally by the rule of a one-party oligarchy." Accordingly, "an understanding of the democracy of the ITU is only the proximate aim of the study. . . . A larger objective . . . is to illuminate the processes that help maintain democracy in the great society by studying the processes of democracy in the small society of the ITU." This organization stands out as departing sharply from the prevailing oligarchic pattern. It is the only American trade union which maintains a two-party system, with regular organized opposition and complete slates of candidates in the election of officers of the international union and of most of the larger locals. These practices have prevailed since the beginning of the century; and because the parties have been of approximately equal strength since 1920, there have been frequent turnovers in both the international officers and in those of the important New York local during the past thirty-five years. In seeking to explain how and why the ITU has managed to maintain its system of democratic self-government so successfully, the authors examine the political life of the organization from many standpoints. The study thus embraces: "the history of the unique two-party system; the behavior of the union members, in and out of the shop; the way in which leaders are recruited; the reasons why their power over the union does not become absolute; the way members become interested in union politics, and the reasons why they are sufficiently concerned about the government of their union to keep it democratic." The incisive performance of these tasks justifies the pronouncement of Clark Kerr, in his Foreword, that this study "is certainly the classic work to date in the general area of the internal processes of a union and the definitive study, perhaps for all foreseeable time, of the particular union under scrutiny, the International Typographical Union." The material is soundly organized and effectively presented, with the aid of 79 figures and 39 tables. There are also two appendices—one, a methodological note, and the other, the interview schedule used in the field work—which are enlightening and useful. The study is of inter-

disciplinary character, and should prove meaningful to economists and political scientists, as well as to sociologists and social psychologists.

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This is the sixth volume in the *Canadian Studies in Economics*, sponsored by the Canadian Social Science Research Council and edited by V. W. Bladen. Its primary purpose is to describe the important governmental developments of the past ten or twelve years affecting labor relations in Canada against the background of the earlier and more limited experiments in this sphere. While the treatment embraces both dominion and provincial enactments, only Ontario and Quebec, among the provinces, are accorded any extended consideration. The dominion policies are set forth in the Wartime Labor Relations Regulations incorporated in Privy Council Order 1003 of February 17, 1944 (reprinted as Appendix I), and in the Industrial Relations and Disputes Investigation Act of June 30, 1948 (reprinted as Appendix II). The analysis includes some attention to administrative applications of these enactments by the Labor Relations Boards, through presentation of some case material both in the text and in a special appendix, but chiefly for illustrative purposes rather than with any intent or effort at adequacy. In the concluding chapter, dealing with the significant issues that have emerged in connection with the labor relations legislation, some consideration is accorded to important controversial matters; for the most part, however, the study confines itself to a straightforward and documented exposition of factual character. This little volume may well serve as a starting-point for more intensive research in various directions.

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NOTES

Eveline M. Burns of Columbia University has been appointed chairman of the American Economic Association nominating committee. She would appreciate suggestions for officers for next year at as early a date as possible. She may be addressed at: 276 Riverside Drive, New York 25, N. Y.

An Announcement regarding the Program for the Annual Meetings at Philadelphia

The annual meeting of the Association will be held at the Hotel Sheraton, Philadelphia, Pa., December 28–30, 1957.

In order to provide the officers of the Association with more adequate information as to papers in preparation that might merit a place on the program of the annual meetings, it has been decided to conduct an open competition. Those wishing to enter the competition should write Professor James Washington Bell, Secretary, American Economic Association, Evanston, Illinois, indicating in not more than 100 words the nature of the proposed paper and requesting an instruction sheet and entry form.

Papers entered in the competition must be in the hands of the committee of judges by September 1, 1957. Each paper will be identified by a code number, and the judges will make their selection without knowing the names of the authors. A moderate number of the papers submitted will be included in the program, along with other papers submitted by invitation. The titles of the winning papers and the names of their authors will be announced at one of the sessions in Philadelphia, and they will be reported in the *American Economic Review*.

Preference will be given both to papers that report on completed or nearly completed substantive research and to those of a theoretical nature that make a contribution towards integrating developments in different branches of economics or developments in economics and some other social science.

The Association has become so large that the officers charged with making the programs have found it increasingly necessary to establish channels through which they can learn of research projects and other inquiries that members have in process. It is hoped that the information which the present more or less experimental contest will provide on the work of all those who enter it will constitute a significant forward step in developing such channels.

MORRIS A. COPELAND, *President*

ANNOUNCEMENTS

A department of economics has been established at the United States Air Force Academy at the iterim site in Denver, Colorado. The staff includes Colonel Robert F. McDermott, professor; Major Charles V. Manes, associate professor; and Major William G. Ryan, Captain Robert E. Duvall, and 1st/Lt. Maurice C. Mackey, Jr., instructors.

The City College of New York has established a program of graduate studies in economics, leading to the Master of Arts degree.

The Human Relations Area Files, Box 2054 Yale Station, New Haven, Connecticut, has announced a new series of country surveys and bibliographies. A country survey on *Afghanistan* is now available; also bibliographies on *Afghanistan*, *Burma*, *China: Modern Economic and Social Development*, *Japanese Sources on Southeast Asia*, and *The Philippines*. Publications now in preparation and to be completed soon are country surveys on Brunei, Sarawak, and North Borneo, Jordan, the Russian Soviet Federated Socialist Republic, Finland, Iran, Lebanon, Syria; also the following bibliographies: Indonesia, Japanese and Chinese Sources on Burma, Syria-Jordan-Lebanon, and Uralic Peoples.

Foreign Scholars in the United States in the Current Academic Year

Attila Karaosmanoglu, lecturer in political science at the University of Ankara, is at Harvard University on a research grant.

Esme Preston, formerly a staff member at the Oxford Institute of Statistics, is visiting lecturer at Tulane University.

Brinley Thomas, of University College, Cardiff, is visiting professor at Duke University in the spring semester.

Deaths

Morton A. Aldrich, dean of the School of Business Administration and professor of economics emeritus of Tulane University, died May 9, 1956.

William F. Christians, professor of geography in the Wharton School, University of Pennsylvania, died March 13, 1956.

Guy-Harold Smith, who had served the Ohio State University since 1914 as chairman of the department of geography from 1921–34 and as professor up to his retirement in 1943, died November 29, 1956.

G. Lloyd Wilson, professor of transportation in the Wharton School, University of Pennsylvania, died April 11, 1956.

Appointments and Resignations

Curtis Aller has been appointed lecturer in the department of economics and the Labor and Industrial Relations Center at Michigan State University.

A. Asimakopulos has been appointed lecturer in economics at McGill University.

Nicholas Balabkins has been appointed instructor in economics at Washington and Jefferson College.

Philip M. Banks has been appointed instructor in finance in the Wharton School, University of Pennsylvania.

Robert T. Barnes has been appointed instructor in finance in the Wharton School, University of Pennsylvania.

Jack F. Bennett, on leave from the Standard Oil Company of New Jersey, is serving as senior economist for the President's Citizen Advisers on the Mutual Security Program (The Fairless Committee).

Robert E. Berry has been appointed instructor in economics in the Wharton School, University of Pennsylvania.

Walter P. Blass has joined the staff of the Office of Far Eastern Operations of the International Cooperation Administration in Washington, D. C.

Jack C. Bloedorn has been appointed instructor in finance in the Wharton School, University of Pennsylvania.

Arthur I. Bloomfield, of the Federal Reserve Bank of New York, has been in Korea on behalf of the International Cooperation Administration undertaking a survey of monetary and fiscal policy in that country. He was visiting professor of economics in the Wharton School, University of Pennsylvania in the fall semester.

Frederick E. Blum has been appointed instructor in finance in the Wharton School, University of Pennsylvania.

Irving Brecher has been appointed associate professor of economics at McGill University.

Edward W. Brennan has been promoted from instructor to assistant professor of accounting, Wharton School, University of Pennsylvania.

Murray Brown has been appointed assistant professor of economics in the Wharton School, University of Pennsylvania.

John E. Brush has been appointed visiting lecturer in geography and industry in the Wharton School, University of Pennsylvania.

Edward T. Bullock has resigned from Seton Hall University to accept an appointment as professor of economics at the University of Miami.

Philip M. Carroll has resigned from the Bureau of the Budget to accept an appointment as assistant professor of economics at Colorado A & M College.

Russell L. Chrysler has been promoted from associate professor to professor of marketing at Los Angeles State College.

Richard C. Clelland has been appointed assistant professor of statistics in the Wharton School, University of Pennsylvania.

Richard V. Clemence has been named chairman of the department of economics at Wellesley College.

Madeline H. Codding has been appointed research instructor in industrial research, Wharton School, University of Pennsylvania.

Robert D. Corrie has been appointed instructor in finance in the Wharton School, University of Pennsylvania.

Fred I. Courtney has been appointed treasurer of Virginia Metal Products, Inc., Orange, Va.

Kenneth Courtney has been appointed instructor in finance at the Ohio State University.

Virgil D. Cover, of Syracuse University, has been in Burma working with Dilworth Walker, dean of the University of Utah, in the establishment of a program in business administration at the University of Rangoon.

Edwin B. Cox has been appointed instructor in statistics in the Wharton School, University of Pennsylvania.

Robert G. Cox has been promoted from assistant professor to associate professor of accounting in the Wharton School, University of Pennsylvania.

W. Arthur Cullman has been appointed associate professor of marketing at the Ohio State University.

William Diebold, Jr., has been appointed visiting lecturer in economics in the European Institute of Columbia University for the spring semester.

Donald F. Dixon has been appointed instructor in marketing in the Wharton School, University of Pennsylvania.

H. Robert Dodge is instructor in marketing at the Ohio State University.

William L. Doremus conducted a seminar in American marketing methods for the French National Sales Executives Association on the invitation of the Association.

William M. Duffus has retired from the Ohio State University where he was professor of finance.

Richard A. Easterlin has been promoted from assistant professor to associate professor of economics, Wharton School, University of Pennsylvania.

Howard L. Englander has been appointed instructor in marketing in the Wharton School, University of Pennsylvania.

Wilson L. Farman was director of the Colgate University Economics Study Group (off-campus undergraduate honors study of economic development) located in Atlanta, Georgia, this year.

Albert Fishlow has been appointed instructor in economics in the Wharton School, University of Pennsylvania.

George Fisk has been promoted from instructor to assistant professor of marketing in the Wharton School, University of Pennsylvania.

Bruno Foa has been appointed visiting professor of economics in the Wharton School, University of Pennsylvania, for the current academic year.

Kenneth M. Ford, has been appointed director of the Graduate Business School and associate professor of business management at Northeastern University.

Benjamin R. Foster has been appointed instructor in geography and industry in the Wharton School, University of Pennsylvania.

Peter G. Franck has resigned from the Council for Economic and Industry Research, Washington, D. C., to accept an appointment as professor of economics and head of the department of social science at Robert College, Istanbul.

Arthur M. Freedman has been appointed lecturer in economics in the Wharton School, University of Pennsylvania.

Lester Fuszara is instructor in management in the Ohio State University.

Paul H. Geithner has been appointed instructor in marketing in the Wharton School, University of Pennsylvania.

Robert B. Giedraitis is instructor in finance in the Wharton School, University of Pennsylvania.

Donald F. Gordon, now in the Wharton School, University of Pennsylvania, on a year's leave, has been promoted to associate professor of economics at the University of Washington.

Paul V. Grambsch has been appointed dean of the School of Business Administration of Tulane University.

Richard W. Graves has resigned from the staff of Tulane University where he was assistant professor of statistics in the School of Business Administration.

Michael F. Grisafe, formerly of Bradley University, is now assistant professor of accounting at Los Angeles State College.

William Hamburger, formerly of Stanford University and the RAND Corporation, has joined the staff of the Aeronautical Research Foundation as an economist.

Talmadge Harris has been appointed instructor in economics and accounting at Washington and Jefferson College.

James Q. Harty has been appointed instructor in geography and industry in the Wharton School, University of Pennsylvania.

Robert S. Hass is instructor in accounting in the Wharton School, University of Pennsylvania.

Francis X. Healy, Jr., has been appointed instructor in economics in the Wharton School, University of Pennsylvania.

Donald Heany is on a year's leave of absence from Georgetown University to serve as consultant with the General Electric Company in New York.

Leonard W. Hein has been appointed assistant professor of accounting at Los Angeles State College.

Rexford Hersey has been promoted from associate professor to professor of insurance in the Wharton School, University of Pennsylvania.

George H. Hildebrand is now director of the Institute of Industrial Relations at the University of California, Los Angeles.

Henry E. Hoagland has retired from teaching at the Ohio State University where he served as professor of finance.

Stanley C. Hollander has been appointed visiting associate professor of marketing in the Wharton School, University of Pennsylvania.

Earl O. Hollenbaugh is instructor in accounting in the Wharton School, University of Pennsylvania.

David E. Horlacher is instructor in economics in the Wharton School, University of Pennsylvania.

William A. Howe, Jr., is instructor in accounting in the Wharton School, University of Pennsylvania.

Walter Isard has been appointed professor of economics in the Wharton School, University of Pennsylvania.

Gene E. Jackson is instructor in accounting in the Wharton School, University of Pennsylvania.

D. Gale Johnson has been named associate dean of the Division of Social Sciences of the University of Chicago.

Robert H. Johnson is on leave from the State University of Iowa to serve as executive assistant to the governor of the State of Iowa.

Edward J. Kilberg has resigned from the research department of the Mutual Life Insurance Company to work on a project at the National Bureau of Economic Research.

John W. Kendrick has been appointed associate professor of economics at the George Washington University.

Lucy W. Killough has retired as chairman of the deparment of economics at Wellesley College. She continues as A. Barton Hepburn professor of economics.

Irving B. Kravis has been promoted from associate professor to professor of economics in the Wharton School, University of Pennsylvania.

I. M. Labovitz has transferred from the Bureau of the Budget to the Legislative Reference Service of the Library of Congress, where he is senior specialist in social welfare.

Howard Laitin has been appointed director of the departments of research and statistics of Michael Saphier Associates and S.U.A. Inc., New York City.

Michael Lalli has been appointed instructor in statistics in the Wharton School, University of Pennsylvania.

Francis Lammer has been appointed lecturer in finance in the Wharton School, University of Pennsylvania.

Don Lawson is assistant professor of marketing at San Diego State College.

Paul H. Levenson, formerly in the Wharton School, University of Pennsylvania, has been appointed lecturer in management at Los Angeles State College.

Howard T. Lewis, professor emeritus of Harvard University, has been professor of industrial procurement at Northeastern University since September 1955.

Arthur F. Loeben has been appointed instructor in geography and industry in the Wharton School, University of Pennsylvania.

John F. Lubin has been promoted from instructor to assistant professor of industry in the Wharton School, University of Pennsylvania.

John P. Lutz has been promoted from instructor to assistant professor of finance in the Wharton School, University of Pennsylvania.

Gordon A. Marker has been appointed instructor in economics in the Wharton School, University of Pennsylvania.

Raymond Mayer has been appointed assistant professor of production management in the School of Business, University of Chicago.

Kenneth M. McCaffree has been promoted to associate professor of economics at the University of Washington.

Adrian M. McDonough has been promoted from instructor to assistant professor of industry in the Wharton School, University of Pennsylvania.

Dan M. McGill has been promoted from associate professor to professor of insurance in the Wharton School, University of Pennsylvania.

Lionel W. McKenzie, of Duke University, will be visiting associate professor at the University of Michigan in the spring semester. In the summer he will direct a workshop at the Social Science Research Council Summer Institute for economists trained in mathematical methods at Stanford University.

S. Sterling McMillan, of Western Reserve University, has been appointed to the executive committee of the Ohio Governor's Council on Atomic Energy.

James McNulty has been appointed associate professor of geography and industry in the Wharton School, University of Pennsylvania.

Gilbert M. Mellin has resigned from the School of Business Administration of Tulane University.

Allan H. Meltzer has been appointed lecturer in economics in the Wharton School, University of Pennsylvania.

Jerome W. Milliman, formerly of Florida State University, has accepted an appointment as assistant professor of agricultural economics at the University of California, Los Angeles.

David N. Milstein has been appointed instructor in economics at Rutgers University.

Burton M. Mirsky has been appointed lecturer in economics in the Wharton School, University of Pennsylvania.

C. Clyde Mitchell has resigned from the University of Nebraska to join the staff of Technical Assistance Experts of the Food and Agriculture Organization. His present assignment is to assist the Ministry of Economics of Mexico on national and regional economic planning.

Donald A. Moore, formerly of Michigan State University, has been appointed assistant professor of economics at Los Angeles State College.

Albert G. Mossawir has been appointed teaching fellow in economics at Wesleyan University.

L. G. Nicolopoulos has been appointed lecturer in economics at McGill University.

Douglass C. North has been promoted to associate professor of economics at the University of Washington.

Lawrence M. Odence has been appointed instructor in accounting in the Wharton School, University of Pennsylvania.

Paul M. O'Leary has resigned as dean of the College of Arts and Sciences to resume his professorship of economics at Cornell University.

Thomas J. Orsagh has been appointed instructor in statistics in the Wharton School, University of Pennsylvania.

Ernest J. Pavlock has been appointed instructor in accounting in the Wharton School, University of Pennsylvania.

Ralph W. Piersall, Jr., has been appointed instructor in accounting in the Wharton School, University of Pennsylvania.

Almarin Phillips, formerly at the Wharton School, is now associate professor in the University of Virginia Graduate School of Business Administration.

Carl A. Polsky has been appointed instructor in accounting in the Wharton School, University of Pennsylvania.

Janus Poppe has been appointed associate professor of economics at Georgetown University.

Robert M. Rauner has been promoted from instructor to assistant professor of economics at Trinity College.

Edward P. Reagen has been appointed assistant professor of economics at Washington and Jefferson College.

Alfred Reifman, of the Department of State, has been appointed deputy director of the International Development Advisory Board, Washington, D. C.

Neil D. Reznik has been appointed instructor in insurance in the Wharton School, University of Pennsylvania.

Raymond W. Ritland has resigned as assistant professor of economics in the School of Business Administration, Tulane University.

Jack E. Robertson has been appointed instructor in economics in the School of Business Administration, Tulane University.

Clyde O. Ruggles, professor emeritus of Harvard University, has been professor of public utility management and regulation at Northeastern University since January 1955.

Theodore Ruprecht has been appointed instructor in economics at Occidental College.

Walter S. Salant, of the Brookings Institution, was visiting lecturer at the Salzburg Seminar for American Studies in Salzburg, Austria in February.

L. H. Samuels, of Johannesburg, has taken a fellowship at Nuffield College, Oxford University, for the year 1957.

Charles Schertenleib has been appointed visiting professor of economics at Georgetown University.

V. Donald Schoeller has resigned from the Wharton School, University of Pennsylvania, where he was lecturer in geography and industry.

Eugene W. Schooler has been appointed research associate in economics in the Wharton School, University of Pennsylvania.

Ben B. Seligman, formerly director of the Washington Office of the American Jewish Committee, has joined the staff of the United Automobile Workers Union as economic and political analyst in international affairs.

Hans F. Sennholz has been appointed professor of economics at Grove City College, Pennsylvania.

Gordan Severance, formerly of San Diego State College, has been appointed assistant professor of finance and law at Los Angeles State College.

Harry J. Shaffer has been appointed instructor in economics at the University of Kansas.

Edward Shils has been appointed associate professor of geography and industry in the Wharton School, University of Pennsylvania.

Edward Simmler, Jr., has resigned as instructor in accounting in the Wharton School, University of Pennsylvania.

Robert H. Smith has been appointed instructor in finance in the Wharton School, University of Pennsylvania.

William J. Smith, Jr., has resigned from Georgetown University and is presently with the Federal Reserve Board serving as economic research consultant.

Eugene Smolensky has been appointed instructor in economics in the Wharton School University of Pennsylvania.

William Snyder has been appointed instructor in economics at Temple University.

Harold M. Somers, dean of the School of Business Administration of the University of Buffalo, has been admitted to the practice of law in New York State and has been appointed chairman of the state's Minimum Wage Board for the Restaurant Industry.

Lewis C. Sorrell, professor of management theory and policy and transportation has resigned from the School of Business Administration, University of California, Los Angeles.

John Steele has been promoted to associate professor of business organization at the Ohio State University.

Herbert Stein has been elected director of research by the Board of Trustees of the Committee for Economic Development.

Matthew J. Stephens has been appointed instructor in accounting in the Wharton School, University of Pennsylvania.

Frank I. Stern has resigned from The Value Line to join Grey Advertising Agency, New York, as economist.

Merton P. Stoltz has been appointed chairman of the department of economics at Brown University.

Williard E. Stone has been promoted from assistant professor to associate professor of accounting in the Wharton School, University of Pennsylvania.

Barrie Storrs has been appointed instructor in geography and industry in the Wharton School, University of Pennsylvania.

R. Stansbury Stockton has been made assistant professor of management at the Ohio State University.

John L. Sullivan has been appointed instructor in marketing in the Wharton School, University of Pennsylvania.

Alfred Tao has accepted an appointment as associate professor of economics at the University of Hawaii.

Benjamin F. Teeter has resigned from Georgetown University to take a position with the Federal Deposit Insurance Corporation.

Benjamin J. Tepping has been appointed visiting professor of statistics in the Wharton School, University of Pennsylvania.

Jack Topiol has been appointed instructor in accounting in the Wharton School, University of Pennsylvania.

Harry M. Trebing has been appointed assistant professor of economics in the College of Business Administration of the University of Nebraska.

Lynn Turgeon has been appointed visiting lecturer in economics at Hofstra College.

William Voris has been promoted from assistant professor to associate professor and head of the department of management at Los Angeles State College.

Gerald E. Warren has resigned from Tulane University to accept an assignment as assistant director for economic development, U. S. Mission to Taiwan, International Cooperation Administration.

Elsie M. Watters has been appointed assistant professor of statistics in the School of Business Administration, Tulane University.

Paul Wells, formerly of RAND Corporation, has joined the faculty of Los Angeles State College as assistant professor of economics for the current academic year.

Richard J. Whiting has been appointed assistant professor of management at Los Angeles State College.

William L. Wilbur has resigned from Memphis State College to become associate professor of economics at Wofford College.

Roger J. Williams, Jr., has resigned from Baldwin-Wallace College to accept a position as economist with the Union Carbide and Carbon Corporation in New York City.

Martin Wilmington has been promoted to adjunct associate professor of social sciences at Pace College.

Bruno S. Wojtun has been appointed instructor in economics at Temple University.

Carl H. Wolf has been appointed instructor in accounting in the Wharton School, University of Pennsylvania.

Dallas M. Young, of Western Reserve University, has been retained as impartial umpire, Cleveland Transit System and Division 268, Amalgamated Association of Street, Electric Railway & Motor Coach Employees of America.

VACANCIES AND APPLICATIONS

The Association is glad to render service to applicants who wish to make known their availability for positions in the field of economics and to administrative officers of colleges and universities and to others who are seeking to fill vacancies.

The officers of the Association take no responsibility for making a selection among the applicants or following up the results. The Secretary's Office will merely afford a central point for clearing inquiries; and the *Review* will publish in this section brief description of vacancies announced and of applications submitted (with necessary editorial changes). Since the Association has no other way of knowing whether or not this section is performing a real service, the Secretary would appreciate receiving notification of appointments made as a result of these announcements. It is optional with those submitting such announcements to publish name and address or to use a key number. Deadlines for the four issues of the *Review* are February 1, May 1, August 1, and November 1.

Communications should be addressed to: The Secretary, American Economic Association, Northwestern University, Evanston, Illinois.

Vacancies

Economics: Instructor or assistant professor in economics. Co-educational Catholic college desires M.A. in economics. Salary $4,500 to $5,500 per year. Successful applicant will teach only economics courses. Opportunity to work for Ph.D. locally. New campus. Opportunity to become chairman of the department when qualified. Address inquiries to: Frank L. Luken, Vice-President, Villa Madonna College, Covington, Kentucky.

Editor, college textbooks: New York publisher seeks young man to assume editorial responsibility for college textbooks in the social sciences. Should be familiar with liberal arts curriculum and should have had some experience in organizing material (not necessarily textbooks) for publication. Copy-editing and proofreading not required. Salary depends upon qualifications; excellent opportunity for rapid advancement. P185

Accounting and finance: In state-supported institution in the Southwest. Teaching mainly upper division and graduate courses in accounting and one course a year in finance. Minimum requirements: Ph.D., with C.P.A. desirable. Professorial rank, salary $7,500 or better; summer teaching extra. Opportunity to increase compensation by working on outside University contracts. Duties may begin February, 1957. P188

Economics: Permanent addition to staff of social science department. Will teach general education economics at sophomore level and senior college or graduate courses in labor economics, history of economic thought, international economic relations, comparative systems. Ph.D. preferred. Rank dependent on qualifications; salary $540-$640 per month for nine months; summer teaching may add two month's salary. Send data and inquiry to Hugh Jameson, Department of Social Sciences, Northern Illinois State College, De Kalb, Illinois.

General economics, public finance, money and banking: Research assistant, with at least an M.A. degree, specialized in public finance and/or money and banking; no experience required; for research unit of a government department in Puerto Rico. One-year contract, renewable. Annual salary $6,000, plus travel expenses to and from Puerto Rico. P189

Economics and statistics: The Air Force Institute of Technology, located at Wright-Patterson Air Force Base, Dayton, Ohio, has an opening for a teacher of economics and statistics, work to begin not later than September, 1957, but may begin sooner if applicant should so desire. The position will carry a civil service rating of GS-11 or GS-12, depending upon the qualifications of the applicant. The beginning salary for GS-11 is $6,390; and for GS-12 is $7,570. Applicants should have a Ph.D. degree in economics or in statistics, have mathematics through integral calculus, and be qualified to teach advanced courses in his specialty and intermediate courses in the other area. Successful teaching experience is also desirable. The teaching load will be light but it is expected that considerable time will be devoted to research in order that courses taught may have the greatest possible applicability to the needs of our students. Duties extend over the entire twelve months but one quarter of each year is usually devoted to study and research. Application should be addressed to Dr. James Roy Jackson, Dean, School of Business, Air Force Institute of Technology, Wright-Patterson AFB, Ohio.

Accounting and statistics: A leading Southern college will have an opening in September, 1957, for a young man with, or close to, Ph.D. Courses will include elementary accounting and statistics. Salary and rank depend upon training and experience. P190

Economic principles, theory, and (preferably) introduction to mathematical economics: Catholic university in large metropolitan, Eastern center, urban co-educational institution. Ph.D. with or without previous teaching experience, or Ph.D. candidate with course requirements fulfilled and orals passed. Rank and salary depend on qualifications. P191

Business administration: Professor wanted for fall, 1957, in private metropolitan university in the Middle West. Must have Ph.D. Salary and rank depend on previous experience, publication, etc. Full-time salary can be supplemented by summer teaching. Opportunity exists for consulting work in the community. P192

Accounting: Midwestern university in metropolitan area desires to add a full-time professor to its faculty in the fall of 1957. C.P.A. and/or Ph.D. required. Salary can be supplemented by summer teaching and consulting work. P193

Economists Available for Positions

Economics: Man, middle-aged, married; M.A., New York University; J.D., Europe. Veteran; knowledge of languages. Looks for adequate opportunity. E585

Corporation economics, marketing and public relations: Man, 45, married; B.S., M.S., Ph.D., fellowships, scholarship and *summa cum laude,* honor societies. Now economist for national company; experience also includes full professorship, research director, marketing and advertising head, naval officer. Desires teaching and research position in university. E594

Economic, business, and insurance history: Man, 37; Ph.D., New York University. Fifteen years of governmental experience, including those of an advisory and administrative nature; 1 year of teaching experience; has considerable counseling experience. Desires research, writing, or teaching position. Interested especially in college or university teaching position. Of special usefulness to life insurance companies as research assistant or historian. E616

International economic relations, comparative economic systems, marketing, urban economics, history of economic thought, public finance, money and banking, economic history of Europe: Man, married; Ph.D., research fellowships. Seven years of university and college teaching; 4 years of research in federal government; experience as consultant; multilinguist; extensive foreign travel. Desires teaching or research position. E628

Management: Man, 44, married; Ph.D., M.B.A. (1956). Nineteen years in industry as chief executive of medium-sized manufacturing concern; some teaching experience. Desires position to teach in the general area of management; can also teach other basic concept courses if necessary. E629

Business cycles, money and banking, statistics, mathematical economics: Man, 36; Ph.D. in economics. Trained at good European and American universities; author of a book. Actually teaching statistics, principles of economics, and consumer economics. Looks for teaching position, preferably near a larger city. E631

Labor relations, labor economics, history of economic thought, economic principles, international trade: Man, 35, Ph.D. Eight years of teaching experience at two large universities; government positions. One book, numerous articles; another book in process. Desires teaching position. E639

Economic principles, modern economic problems, finance and banking, money and banking, personal finance, retirement problems, public utility economics and rates: Man, 60, married; M.B.A., Northwestern University. Combined university and business experience: 29 years in teaching economics and finance in large Midwest university, evening division; 33 years in economic research, business forecasting, and employee training for large Midwest metropolitan electric utility company. Prefers full-time teaching with opportunity for writing. Partial to mild climate. Available in June, 1957. John F. Reinboth, 417 Jackson Avenue, Glencoe, Illinois.

Economic thought, price and income theory, money and banking, corporation finance, investments, managerial economics, international economics, economic systems: Man, 34, married; M.S., A.M., Ph.D., University of Illinois. Five years in business; last 4 years in teaching. Available for teaching position in September, 1957. E644

Management and industrial relations: Man, 34; Ph.D. Currently employed as head of management development by large multiplant manufacturing organization. Seven years of teaching, including 2 years as chairman of a large department; industrial experience as a consultant in organization, industrial relations, and methods engineering; industrial experience in supervision, methods engineering, and industrial relations. Available in September, 1957. E646

Economic theory, history of thought, money and banking, public finance, statistics: Man, 27, married; M.B.A., completing Ph.D. course requirements at Harvard. Two years with bank and trust company; 2 years in statistical research; 2 years of teaching experience. Desires teaching position beginning fall, 1957. E648

Economic theory, business cycles, comparative systems, history of economic thought, public finance, labor: Man, 27; Ph.D. Publications; 3 years of teaching experience; currently teaching undergraduate theory and doing business research in large Southern university. Desires permanent, stimulating position in large non-South university offering graduate work in economics. Available in September, 1957. E650

Economic principles, economic systems, money and banking, corporation finance, public finance, insurance, business research: Man, 38; B.S., Ohio State University; M.A., University of Cincinnati; Ph.D. dissertation in progress, University of Cincinnati. Four years of teaching; 2 years as department chairman, economics and business, Midwestern college. Ten years of experience in banking and insurance. Active in business and civic affairs. Shrewd financial ability and judgment. Desires a permanent, challenging, attractive position in business with unlimited opportunity for development and progress. Must locate in Southwest or West Coast. E651

Applied economic research and analysis, area resources and economic development, business and industrial location, international economic relations, related industrial development activities: Man, 39, married; M.A. Extensive, responsible experience includes: planning and effectuation of research projects; report writing; applied knowledge of public administration and legislative processes; evaluations for executive decision; program planning and co-ordination; conferring and negotiating effectively with leaders and experts in business and public life. E652

Economic principles, economic thought, economic history, labor economics, money and banking, public finance, business cycles: Man, middle-aged; Ph.D., social science. Broad experience in teaching, government, and business. Southeastern or Southern location preferred but others considered. E653

Money and banking, finance, investments, economic principles: Man, 42, married; Ph.D., 1942. Fifteen years of teaching experience; 8 years in present position teaching graduate and undergraduate courses in money and banking and economics. Experience also includes government employment in a research and administrative capacity, consultant in the field of banking, writing and public speaking. Seeks full professorship or position in private finance. E654

Principles of economics, economic theory, political theory, sociology; Man, over 50; Ph.D. Available as a teacher and/or administrator. E655

Economic theory, international economics, economic thought, labor, money and banking, business cycles, economic systems, economic geography: Man, 44, married; Ph.D. Twelve years of teaching experience; 4 years of government; 2½ years United Nations experience in Europe; 4 years university administration; 2 years private international agency. Currently teaching in small liberal arts college near Washington, D.C. Desires Northern or Western U.S. for permanent location. Available in September, 1957. E656

Labor economics, comparative economics, economic principles: Man, 39, married; Ph.D., University of Pennsylvania. Currently professor of economics in a good liberal arts college. Experience in government labor relations and labor arbitration; has published a book and two journal articles. Desires summer, 1957, appointment in Rocky Mountain states or Southwest. E657

Public finance, principles, money and banking, statistics: Man, 36; Ph.D., University of Wisconsin. Four years of economics teaching experience; research experience in government and Federal Reserve bank; articles in learned journals. Desires teaching position, preferably in northern part of U.S. E659

Administrative, personnel, and production management: Man, 37, M.S., requirements for doctoral degree completed except dissertation, which is in progress. Five

years of progressive experience in business and industry; 5 years of successful university level teaching in the above fields. Primary interest is in teaching but may consider some part-time administrative duties. Desires assistant or associate professorship starting September, 1957. E660

Economic principles, economic theory, history of economic thought, economic history, money and banking, business cycles, international trade: Man, 29, married; B.S., M.A., Ph.D. dissertation in progress. Veteran, captain, U.S.A.F. Res.; experience in personnel and administration; holds public school teacher's certification. By availability date (July, 1957) will have 2½ years of teaching experience as teaching-assistant and instructor. Desires teaching position. E661

Management, marketing, business history: Man, 45, Ph.D. Business experience plus 11 years of teaching at the undergraduate and graduate levels. Author of two college texts. Desires teaching position beginning September, 1957. E662

Economic principles, accounting, economic history, business cycles, public relations: Man, 43, A.B. (English), B.S. (accounting), Ph.D. (economic history), London. Six years of teaching experience (in English) at two large universities and a state college and in adult education. Has taught English and economic principles abroad. European correspondent for American liberal monthly for 4 years; experience in business management, both private and quasi-military; now chief of public relations for quasi-military retailing organization in Europe. Wishes to return to university or private research. Would consider university public relations—teaching-research combination or English-economics teaching or teaching-research combination. E663

Economic analysis, statistics, forecasting, econometrics, current economic problems, economic principles, money and banking, economic history: Man, 32, married; completed Ph.D. credit requirements. Six years experience teaching, government and private industry research. Desires teaching position or research. E664

Economics, economic history, financial history, public finance, banking, investments: Man, Ph.D., New York University, 1953. Currently assistant professor at large Eastern university; has published articles, reviews; is coauthor of book and associate editor of scholarly journal. Would like to relocate and would be willing to do some administrative work in addition to teaching. E665

Economic development of underdeveloped areas, international economics, planning, transportation and industrial location, population, general economics: Man, 40, married; M.A. (economics), University of Nebraska, M.A. (international administration), Columbia University, Ph.D. (planning and economic development), University of Chicago. Four years of international service in Africa and Asia; experienced teacher, public lecturer, and research director. Available for teaching and research director, September, 1957. E666

International trade, comparative economic systems, economic thought, money and banking, trade-unionism, labor relations: Man (German), 27, married; Ph.D. Trained at German and American universities. Some industrial and part-time teaching experience; multilinguist. Desires teaching or research position for fall, 1957. R. Sell, 2622 S. Harding Ave., Chicago 23, Ill.

Economics: Man, 52, married; Ph.D., Stanford University. Twenty-five years of university teaching in many fields, much at graduate level; research and administrative work for government and private foundations; business experience; 2 books plus many articles in professional journals. Seeks challenging new position at end of present visiting professorship in 1958 (conceivably earlier). E667

Theory, transportation, corporation finance, social control of business: Man, 35, married; Ph.D. Five years of university teaching experience; 1 year of government service; publications. Desires teaching and/or research position. Available in September, 1957. E668

Economic theory, trade, history, industrial concentration, monetary theory: Man, 30, married; M.A.; all requirements for Ph.D. complete except dissertation and first draft is completed. Four years of teaching experience at large Eastern university in fields listed above at both graduate and undergraduate level; 2 years of experience in industry in field of market research and general statistical analysis; has taught principles, economic geography, advanced theory, and history. Seeks relocation in school hospitable to research. Résumé upon request. Available in September, 1957. E669

Labor economics, national income accounting and analysis, economic history and development, economic theory, social control of business and labor, economic principles: Man, 31, married; Ph.D. from Ivy League School; Phi Beta Kappa. Four years of full-time teaching experience; some publications; also has research projects in progress. Would like teaching position in East, South, or Midwest. E670

Economics, accounting, business administration, industrial management, industrial relations, personnel management: Man, B.A., National Peking University; M.B.A., University of Pennsylvania; requirements for Ph.D. completed at University of Chicago. Five years of experience in college teaching; 1 year as department head at Midwestern university; interested in writing articles for learned publications; active worker with students and in community. Desires teaching or research position; prefers to locate in East or Mid-Atlantic states but will consider other areas. E671

Principles of economics, economic analysis, international trade and finance: Man, 41, married; M.Sc. (Econ.), London. Ten years of experience as responsible official in an international agency dealing with international trade and economic relations. Desires a teaching position to apply and develop his first-hand knowledge in this field. Has teaching experience gained in the course of conducting training classes for government officials. E672

Public utilities, money and banking, public and private finance, statistics, budgeting: Man, 30, married; B.A., M.A., Ph.D. dissertation in progress. Scholarship, assistantship and honor societies; 5 years of teaching and business experience. Business experience includes daily contact with top management. Desires academic position. Available for fall semester, 1957. E673

Monetary theory, elementary and advanced theory, international trade, history of economic doctrines, government and business: Man, 46, married; M.Sc. (Econ.), London; Ph.D. Wide teaching experience, graduate and undergraduate; administrative work in federal government. One volume published; another ready for publication. E674

Labor economics, money and banking, history of economic thought, economic theory, economic history, industrial organization and market control, international trade, comparative economic systems, principles of economics, marketing: Man, M.A., Washington University; J.U.D.; course-work completed for Ph.D. (economics) at a Midwestern university, dissertation in progress. Available for teaching and research. E675

Economic principles, labor economics, economic history, business cycles: Man, 37; M.A.; working on Ph.D. Currently employed at large Eastern university; 5 years of teaching experience; 5 years of experience in industry. Desires teaching position. E676

Economic principles, public finance, statistics: Man, 29, married; M.A., University of Illinois. Four years of experience in credit and collections. Seeks teaching position. Prefers California or Pacific Northwest. E677

Economic theory, business cycles, statistics, industrial organization, marketing: Man, 30, married; Ph.D., University of California, 1956. Six years of teaching experience; presently employed in a school of business administration. Desires teaching position where a social orientation and research is emphasized. E678

Labor economics, economic principles, history of economic thought, planning: Man, 45, married; Ph.D., Columbia University. Seven years of teaching experience; 10 years of experience with federal government in responsible staff positions; publications. Now professor of economics at small Eastern university. Desires teaching position at larger institution. E679

Labor economics, industrial relations: Man, 33; Ph.D., Columbia University. Five years of teaching experience; recent labor publications. Interested in participating in a graduate program. E680

Industrial organization and control, history of political ideas: Man, Ph.D. from German university. Lecturer, Munich, 1954-55; Fulbright Fellow, Columbia University, 1955-56, and visiting lecturer. Book on democracy and monopoly in the U.S. in press. Seeks position as visiting lecturer for academic year 1957-58. E681

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